A Minsky Bubble? Economic growth and the financial sector in 1763–72

2. A Minsky bubble? Economic growth and the financial sector in 1763-72

The next two chapters will try to determine in what ways, if any, the 1772-3 crisis can be attributed to the growth of instability in the financial system in the decade following the signing of the Peace of Paris,[1] in 1763. Our points of departure for this discussion will be the two competing claims in the literature for the causes of this crisis: that the period preceding it can be characterised as a Minsky bubble (rational or irrational); alternatively, that the system was made unstable through intervention by the authorities (both by the legislature and the BOE).[2] More specifically, we will attempt to answer a series of interconnected questions:

1. Did the end of the Seven Years War provide a clearly observable economic displacement? Did the contemporaneous Continental crisis in 1763 have any effect? Ultimately, was the period 1763-72 an economic "boom"?

2. Was finance directly connected and even responsible for these events, either by facilitating any boom or bubble, or simply by providing the mechanisms through which a crash could propagate?

3. Was asset speculation and monetary expansion as prevalent and excessive as claimed in the traditional account? Was the Ayr Bank project frivolous, mismanaged, or corrupt ?

4. Was the Government's involvement in EIC affairs and its passage of the 1765 Act on Scottish banking practices the real causes of the 1772 crash, thus

[1] Kindleberger, *Manias*, p. 123.
[2] The term "authorities" is used in a broad sense for the BOE which remained a private monopoly company all through the period.

supporting the claims of those who deny any inherent instability in the financial system?

In the course of answering these questions we will include a basic overview of British finance in the 1760s and its role in the structure of the colonial trades with North America; the monetary and legal framework under which finance operated, with a particular emphasis on banking, stock speculation, paper money, and the role of bills of exchange in the money markets; and finally an overview of the salient political controversies, particularly that of the EIC.

In search of an economic displacement

This section has no pretensions to being a thorough overview of the state and dynamic of the British economy in the 1760s and 1770s. That would be needlessly diversionary for this discussion, not to mention perforce shallow and incomplete. Academic literature on economic growth in the Eighteenth Century is substantial and longstanding, but has generally treated these two decades in terms of the wider debate on British industrialisation. Though some sporadic claims specific to 1763-72 have been made, notably by Hoppit, Hamilton, Price, and Sheridan, emphasis has rather been on long term trends over a period of many decades and reaching well into the nineteenth century, the methodology of measuring economic growth, the precise timing of its acceleration during the Industrial Revolution, and even the question of whether economic acceleration (or indeed an Industrial Revolution) happened in the first place. We are rather more interested in assessing changes in economic growth rates for the shorter timescales of the two decades preceding the 1772 crisis. For this we must return to the same annual time series data that has been used in this literature and try to extract any information that might be lost in these studies of long run growth. The time series mainly comprise Customs and Excise returns for a variety of commodities and manufactured goods, and are compiled in a set of sourcebooks, most notably the *(Abstract of) British Historical*

Statistics by B. R. Mitchell (originally together with Phyllis Deane) and the *English Overseas Trade Statistics* by Elizabeth Boody Schumpeter. In addition, there is the pioneering work on economic growth by Walter Hoffmann, Phyllis Deane and W. A. Cole, later revisions by, among others, N. F. R. Crafts, C. K. Harley, Stephen Broadberry**,** Bruce Campbell, Alexander Klein, Mark Overton and Bas van Leeuwen**,** as well as the seminal studies on British industrial capital formation by François Crouzet, Charles Feinstein and Sidney Pollard.[3] The analysis of this data in the Industrial Revolution literature generally proceeds by nominal decade, meaning 1760-1770 and 1770-1780 for our timeframe. This practice is necessary for removing noise from long-run growth trends; however, it also removes some of the necessary detail for the shorter time scales we are interested in, and may even confuse the resulting picture by including 1763 with its possible positive displacement (and perhaps the negative impact of the simultaneous Continental crisis) along with the last three war years (1760-62). Similarly, any residual growth in the early 1770s may be obscured by including the effects of the 1772-3 crisis (and later of the American War) within the same decade under observation.

It is more meaningful for our purposes to focus on the period 1763-72 as a unit and to compare it both with the crises (financial and political-military) that followed it, and also with an appropriate period preceding the posited 1763

[3] The literature is vast and active. The discussion in this chapter makes use of data, concepts, and aspects of the debate found in Deane and Cole, *British economic growth*, Boody Schumpeter, *English overseas trade* statistics, Mitchell and Dean, *Abstract*, Broadberry et al, *British Economic Growth, 1270-1870,* Crafts, *British economic growth in the Industrial Revolution*, Crouzet, *Capital formation in the Industrial Revolution*, Feinstein and Pollard, *Studies in Capital Formation in the United Kingdom*, Crafts, 'British Economic Growth, A Review of the Evidence', and 'British Economic Growth, Some Difficulties of Interpretation', Crafts and Harley, 'Output growth and the industrial revolution', Crafts, Leybourne, Mills, 'Trends and cycles', Harley, 'British industrialization before 1841', Jackson, 'Rates of industrial growth', Brezis, 'Foreign capital flows in the industrial revolution', Hoppit, 'Counting the industrial revolution', Williamson, 'Why was British growth so slow?', Berg and Hudson, 'Rehabilitating the Industrial Revolution' and 'Growth and Change', Greasley and Oxley, 'Rehabilitation sustained', Temin, 'Two views on the British Industrial Revolution'.

displacement. Unfortunately, the very nature of this period as a rare peaceful interlude between two major wars which makes it so attractive to study in the first place also makes it difficult to compare with a similar peaceful interval that is close to it in time. The obvious comparison is instead with the Seven Years War itself, which could furthermore help identify any displacement taking place in 1763. If the end of the war had such a significant impact as to eventually lead to the growth of a bubble, then we should be able to discern these changes by comparing the prevailing growth trends in these two periods. In some ways, looking back all the way to 1745-6 would have been even better as this might have illustrated the effects of the Jacobite rebellion, the defeat of which was as much of a paradigm-shifting event (particularly for Scotland) as victory in the Seven Years War ever was. Unfortunately, the time series data, already sparse enough for the Eighteenth Century in general, become even sparser before 1750.[4]

In order to have a better chance of capturing any displacement signals, our analysis will offset the Seven Years War period backwards by one year from its actual historical demarcation (1756-63). This is to include any specific 1763 effects (displacement and/or Continental crisis) within the "boom decade period", and conversely include any negative effects from the 1756 declaration of war within the wartime period. The comparison therefore will be between 1755-62 (the “Seven Years War”) and 1762-72 (the “Boom Decade”). As the time series are annual in nature, and as the 1772 crisis mostly occurred after midsummer when at least some of the commodities observed had had their accounting closed for that financial year, we will include 1772 itself in the “Boom Decade” period; any crisis effects should be apparent from 1773 onwards. Occasional shifts in this interval will be necessary to better capture (or exclude) the effects of 1772, especially for some Scottish trends

[4] For instance, Feinstein and Pollard’s analysis starts at 1750, at least when there are data they can use that go far back (which is not all that often).

which tend to include the negative influence of the crisis in the 1772 rather than 1773 data point.[5]

There have been several reservations expressed in the literature regarding the use of this time series data.[6] These can be broadly summarised as follows:

1. The data are inherently untrustworthy, as they fail to capture the effects of smuggling, evasion, and corruption among Revenue officials.
2. The time series generally include only those commodities that were within the scope of the Revenue. They therefore comprise only a part of the economy, and not necessarily the most important part at that. Agriculture, household work, and non-marketed economic activity are among the most notable omissions. Similarly, the data tends to emphasize foreign over inland trade.
3. Drawing conclusions for country-wide economic trends in this period is a precarious undertaking, as it implicitly assumes a greater degree of economic integration across Britain that there actually existed. Regional differentiation was the rule rather than the exception in the mid-eighteenth century.
4. There are serious methodological difficulties with the economic sector weightings used to create indicators of aggregate economic activity.

There are fair points in all of the above, particularly the observation that it is difficult to capture regional variations from such consolidated data. Nevertheless, none of these objections materially affect the essence of this exercise, which is to identify the potential precursors of a bubble in the 1760s. It is unlikely that one such could grow undetected in "invisible" areas of the economy like household work or non-marketed economic activity, while at the same time not impacting at all those we *do*

[5] We shall return to this issue in the discussion of the crisis' impact in Chapter 5.
[6] For instance Hoppit, 'Counting the industrial revolution', pp. 183-5.

have data on. Moreover, such a "cottage industry bubble" would have been equally unlikely to have materially depended on financial credit for its maintenance, and thus to be negatively affected by the 1772 credit crunch. There were certainly non-monetized credit relationships in local communities engaged in such work,[7] but such credit did not generally depend on the sort of high finance that is supposed to have blown up the 1760s credit bubble. When it comes to smuggling and evasion, the shortness of the time period under observation may come to our aid. Smuggling trends certainly fluctuated over the Eighteenth Century, especially when new regulations were introduced or old ones repealed.[8] Nevertheless, it is more than possible that in the absence of such legal externalities, the rate of change of smuggling and evasion trends was much slower than a potential credit- or psychologically-induced market mania. The controversy over sector weighting, while important enough in itself, can be partly bypassed by investigating each time series individually, or at most as a grouping of a small number that are strongly correlated.[9] For the same reason, we will also employ as basic (perhaps to the point of naiveté) a quantification methodology as possible. Specifically, for each period ("Boom decade" and "Seven Years War") we will present a total return and a compound annual growth rate (henceforth: CAGR) as an expression of their growth trends. Similarly, we will include an average annual growth rate (henceforth: AAGR) and the standard deviation of annual returns as an expression of trend volatility. To quantify "displacement" we will present both the individual annual returns for 1762-3 (that is, a rough measure of the first derivative of the trend), and the difference in CAGR between the two periods under observation (that is, a rough measure of the second derivative of the trend). It must be stressed that we will *not* make an evaluation of

[7] Muldrew, *Economy of Obligation* and 'Hard food for Midas', Anderson 'Money and the structure of credit'.
[8] Cole, 'Trends in Eighteenth-Century Smuggling' and 'Rejoinder'.
[9] For instance the time series "retained raw cotton imports" in Table2 is a simple difference of raw cotton imported less that re-exported.

the absolute growth rate for these individual time series, much less for the aggregate economy. Whether a growth rate of, say, 1% or 2% is "large" or "small" for this period is not pertinent to this analysis – we are merely looking for a "step change" in these growth rates that might justify claims of a displacement.

For ease of interpretation we break up this simple analysis into four broad categories: Aggregate Economy, Production, Transport and Communication, and Foreign Trade.

(a) Aggregate economy

Table 1 presents three sets of aggregate growth indices: Hoffman's original work from the 1950s, the revisions by Crafts and Harley in the 1980s and 1990s, and the most recent (2015) estimates by Broadberry et al. The latter include nominal and real (i.e. price-adjusted) estimates, as well as sectoral breakdowns. In order to put the older estimates into some comparative context with Broadberry's real economy estimates, Table 1 also displays trends for consumer prices as expressed by the Schumpeter-Gilboy index. This latter measure indicates a slight post-war acceleration in inflation, particularly as expressed by the index of consumer goods. This could be attributable to a more vigorous post-war economy, or to money illusion caused by excessive paper money issuance. There is nothing, however, that could be described as either dramatic or definitive. Moreover, producer goods of the type that might be characterised as industrial precursors (for instance coal, bricks, lead, tiles, hemp, and so forth) in fact display price *decreases*, both in absolute and in relative CAGR terms.

Given recent trends in the scholarship of the early Industrial Revolution, it is not surprising to see that newer estimates for economic growth tend to be lower than older ones. Under the Hoffman measure one might argue for both vigorous growth and an accelerating economy after the end of the Seven Years War. The later

Crafts-Leybourne-Mills (CLM) index of aggregate economic growth also demonstrates an observable, though smaller, positive shift. Depending on the specific version of the CLM index used, there is an increase in the CAGR between the two periods under observation between 1.3% - 3.8%.[10] The latest estimates by Broadberry et al on the other hand show a *negative* (i.e. decelerating) CAGR between the two periods under observation, both in nominal and (especially) in real terms, which is inconsistent with the hypothesis of a post-war economic displacement. The displacement thesis is however somewhat salvaged even under these latest estimates when taking each individual sector of the economy separately: according to Broadberry et al, while both agriculture and services were actually contracting in absolute terms, industry was showing a modest but observable acceleration. This is consistent with the supposition of a dual economy being in operation, with a vibrant "new economy" in manufacturing and a sluggish or even receding "old economy" in agriculture and services. The effect is not dramatic but in principle could have resulted in a Minsky asset bubble, especially if this growth of new industry was heavily dependent on continual new injections of capital of the "Ponzi" or "Speculative" sort.

(b) Production

The picture arising from the individual, untreated and unweighted, time series for production is decidedly mixed. Most series show a healthy enough growth rate in the 1760s, with the emblematic Industrial Revolution industries of textile and metals being predictably prominent. The pre-1772 growth narrative for textiles has been particularly emphatic in the literature for the case of Scotland, where the growth of its staple linen industry has been specifically mentioned by Hamilton as a major

[10] As there is a potential time lag in translating the effects of a displacement impulse (positive or negative) across the whole economy, for the case of these aggregate indices alone we define the effects of 1763 itself as the total return over the two year period 1762-4. For the same reason the impact of the 1772 crisis as discussed in Chapter 6 will include the index values for 1774 as well.

engine for the 'long period of economic progress' that peaked just before the Ayr Bank failure.[11] Hamilton however identified the 'Forty-Five rather than the Peace of Paris,[12] as the major event that began this growth dynamic, and the times series trends related to Scottish linen manufactures bear this out (Table 2). Although both the quantities of linen stamped for duty and those exported certainly grew during our posited "Boom Decade", they had grown even more strongly during the preceding war period. Growth rates in fact appear to have *slowed down* somewhat after 1763. Other time series, for instance those for English printed goods (silks, linens, calicoes and stuffs) charged with duty do show some accelerating growth after 1763. Raw material trends (retained raw cotton and silk) are even more emphatic in showing a large positive CAGR change of as much as 16.4%, though these series are too volatile to draw firm conclusions for a possible displacement for the short time scales of the present investigation. Finally, the only proxy data for the leather industry that exists for this period (hides and skins charged with duty), demonstrates a mature industry growing slowly and displaying no notable positive jump in activity during our period. In all, there is a sense of this being a vibrant industry, but one without as yet possessing the sort of fundamental shift in activity that would in itself justify the formation of a bubble before 1772.

Some of the time series associated with metals and mining (Table 3) also show a noticeable acceleration of growth between the two periods, particularly those for white tin paying coinage dues, copper sold at public ticketings in Cornwall and Devon (3.8), iron imports and exports, and above all for steel exports (a change in CAGR 11%). Growth in pig iron production in fact rather slowed down with the coming of peace. On the other hand, the coal production estimates given by Pollard for the whole 1755-1785 period show a consistent, but not obviously accelerating,

[11] Hamilton, 'Ayr Bank', p. 405.
[12] Kindleberger, *Manias*, p. 123.

CAGR between 1.8-2.3%, though the quinquennial nature of this data prevents us from constructing trends specific to the 1763-72 period.[13] One of the most important events taking place in the metals industry in this period was the establishment of Carron Company in Scotland in 1759 by the Englishmen Samuel Garbett and John Roebuck and the Scot William Cadell. In its first 15 years of existence the company's affairs were dominated by another Englishman, Garbett's son-in-law Charles (later Sir Charles) Gascoigne, who gradually pushed out the Roebuck and Cadell families.[14] We will return to the matter of the company's finances and corporate politics in more detail in later sections. For the purposes of the present discussion it should be noted that there are hardly any figures to measure the company's growth in this period. The first surviving sales figures date from 1773, after the company was officially chartered, and the first dividend returns from 1770.

Growth trends in other production areas are inconclusive. The figures for brewing and non-colonial spirits (Table 4) are either too volatile (hops, spirits) or mostly conforming in their long term trends (malt, beer) to allow for any clear displacement signals. The weakly negative trend for small beer production in particular was part of a long time process which would see this commodity virtually abolished by the first decade of the Nineteenth Century.[15] The picture arising from the miscellaneous production time series (soap, candles, starch, glass and paper) is similarly equivocal (Table 5). It must be stressed here that tax evasion for some of these commodities (for instance, soap) was reportedly so rampant as to make this data particularly unreliable.[16] The same can be said even more assertively for the

[13] Pollard, 'New estimate of coal production'.
[14] Campbell, *Carron Company*, Norris, 'Struggle for Carron', Watters, *Where iron runs like water.*
[15] For the brewing industry in general, see Mathias, *Transformation of England*, pp. 208-63.
[16] Hoppit, 'Counting the industrial revolution', p. 179.

distillation of Scotch spirits, for which the crushing majority of operating stills were illicit.[17]

(c) Transport and communications

Large scale transportation projects have been prominent in the pre-1772 growth narrative. Hoppit has specifically singled out the initiation of seven new canal constructions between 1766-71 among the 'many areas of economic advance in England' in the 1760s, and noted 'a marked peak' in the number of turnpike acts in 1770.[18] William Albert explicitly identified a 'Turnpike Mania' beginning in the 1750s, though his figures suggest 1765 as the absolute legislative peak in that area (Figure 2.6).[19] Canals and turnpikes feature prominently on the Scottish side of the story as well, with Hamilton specifically mentioning the launching of the Forth & Clyde and Monkland projects in his macroeconomic setting of the Ayr Bank episode, while Ayrshire 'led the way… with two general Turnpike Acts in 1766-7 and 1774'.[20] Forth and Clyde Navigation in particular was a major undertaking, with over £128,000 in subscribed capital and the Duke of Queensberry (who was at the head of the Ayr Bank project as well) appointed as chairman.[21] In the same analysis, Hamilton also noted the growth of Scottish shipping, reporting an increase of almost 70% in total tonnage between 1760-72.[22]

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[17] Hamilton, *Economic History,* p. 106, gives an estimate of 400 illicit stills against only 8 licensed ones operating in Edinburgh alone in 1777. For more on the illicit Scotch whisky trade in the Eighteenth Century (though somewhat after the period examined here) see Devine, 'Rise and Fall of Illicit Whisky-Making'.

[18] Hoppit, 'Financial Crises', pp. 51-2.

[19] Albert , *The Turnpike Road System*, p. 125.

[20] Slaven, *Development of west of* Scotland, p. 38.

[21] Hamilton, 'Ayr Bank', p. 406, Slaven, *Development of west of* Scotland, pp. 31-6. For a detailed look at the financial aspects of the Forth and Clyde canal project, see Forrester, 'Early canal company accounts'.

[22] Hamilton, 'Ayr Bank', as above.

Table 6 displays the trends in transportation investment, derived from Feinstein and Pollard's data analysis.[23] Aggregate figures are dominated by the broadly constant investment in parish highways, which dwarfed all other components in this period. Turnpike investment (an estimate of actual capital injected rather than simply the number of turnpike acts passed) shows a steady growth, although the CAGR differential after 1763 is a mere 1.4%. The growth in canal investment on the other hand is as dramatic as the traditional narrative would have it. Though in percentage terms the 375% increase taking place in 1759 is by far the biggest annual rise in this dataset and the reason behind the small apparent CAGR reduction during the "Boom Decade", in absolute terms the million pound increase in the two year period 1769-70 can be truly characterised as spectacular, and briefly made this component the second largest in absolute terms. It should be noted that the time series of such a speculative and capital-intensive activity is predictably volatile, and that the start of the drastic upward trend predates 1763 by five years. Furthermore, canal construction was not the only investment in British waterways in this period; Acts of river improvement were being passed since the 1660s, with a marked increase in their number (and capital diverted to them) in the second half of the Eighteenth Century.[24] If anything however, all this rather reinforces the picture of a nascent canal investment mania that picked up pace as the 1760s drew towards their end.

(d) Foreign trade

Contemporaries identified above all the growth of trade as the main cause of the 1772 crash, even when they resisted the temptation to characterise such growth as imprudent or speculative. They also focused on the use of bills of exchange as a

[23] Since their figures for 1772 seem to incorporate the effects of the crisis for this case alone we will truncate the "boom decade" at 1771.
[24] Ward, *Finance of canal building*, pp. 1-17.

credit instrument to achieve this commercial expansion as the main agent which 'fanned the flames' of the incipient mania. The anonymous author of the pamphlet *Inquiry on the Late Mercantile Distresses in England and Scotland* that was published shortly after the June 1772 crash could not have put the post-1763 displacement and monetary/credit expansion narrative more explicitly:

> The success which the Providence of the Almighty favoured us with, in the late war, extended our general commerce so far beyond its usual degree, that the Capitals of the most wealthy parts of the Kingdom became disproportioned to the amount of their dealings, and the deficiency was supplied by the established Credit of our Bills of Exchange, both foreign and domestic… Not only the merchants in this and several other Countries raised large sums upon the Credit of their Bills of Exchange, but even the Contractors of Supplies for the Armies, and the Financiers of Princes, anticipated their real Funds by the Circulation of Bills of Exchange

Table 7 presents the foreign trade trends for England and Scotland. As might be expected of an economy that started from very lowly origins, Scottish growth rates consistently outperformed their English counterparts over both periods under observation. Scotland's increasing share of the American tobacco trade from a fifth of the British total in 1744 to over half in 1769 was the most notable component of this expansion.[25] There was even some growth in Scottish imports of sugar, rum, and cotton, though in absolute terms these were dwarfed almost to insignificance by their long-established English counterparts. Almost all of this activity was centred on the Clyde and destined for re-export to England and, increasingly, the Continent, particularly after Scottish firms like William Alexander and Sons (who played a

[25] Hamilton, *Economic History*, pp. 255-6, Slaven, *Development of west of Scotland*, pp. 20-4.

prominent part in the 1772-3 events) won the lucrative monopoly contract with the French Farmers-General.[26] The adoption of non-importation agreements by the American colonists after 1765 had a predictably negative effect on trade volumes, but after most of the Townshend duties were repealed in 1770 Scottish tobacco imports once again grew rapidly, reaching an all-time high of 47 million lbs in 1771. As evidenced in Table 7, English tobacco imports seem to have been worse affected by the political situation, demonstrating a clear decline in volume between 1763 and 1770, whereas their Scottish competitors appear to have weathered this particular storm far better.

As always with trade figures from this period, one must be especially careful to consider the potential impact of smuggling. For instance, there are indications that the level of tobacco smuggling in Scotland consistently declined after 1750 before picking up again in the mid-1770s.[27] If this was indeed the case it would reduce real growth rates during our posited "Boom Decade", as some of the observed expansion could well be caused by a shift from illicit to legal consumption. The same declining trend was originally observed by Cole as regards tea smuggling, though his methodology and conclusions have been disputed in later literature.[28] Tea smuggling was heavily influenced by the prevailing duty regime for this commodity in Britain, which not only remained consistently high up to the Commutation Act of 1784, but was also subject to frequent changes generally correlated with the state of war and peace. There were duty decreases in 1745 and 1767, and increases in 1747 and 1759. In 1772 itself the relief given by the removal of the 1s per lb Excise duty in 1767 was repealed, and duty was even further increased in the 1770s until finally the Commutation Act of September 1784 removed most of these burdens. War also served as a direct and perhaps even more

[26] Forbes, *Memoirs of a banking-house,* pp. 27-8.
[27] Nash, 'Tobacco trades, legal and illegal trade', p. 367.
[28] Mui & Mui, 'Trends in smuggling reconsidered'.

drastic externality than wartime-inspired revenue measures. It has been assumed that throughout the Seven Years War the level of tea smuggling was materially depressed, since it sourced tea that was originally shipped to the Continent and which was accordingly not subject either to high duties or the EIC's monopoly privileges. With the coming of peace many of the practical obstacles in shipping illicit commodities between the former belligerents were removed. According to the EIC's (possibly exaggerated) complaints, tea smuggling had reached new heights during peacetime and even during the first phases of the American War, before the entry of France changed it into a European one. In either case, if the pattern of a consistent decline in smuggling as suggested by Cole is as true for tea as is for tobacco, then the differentials in real growth rates between the two periods under observation should be assumed to be somewhat lower than the nominal ones presented in Table 7.

In any event, even these nominal figures on their own do *not* send any clear signal of a dramatic acceleration after 1763, but again rather point to a continuation of long-term trends. English exports and re-exports in fact slowed down to about half their wartime growth rate. The English sugar trade, both in volumes imported and revenues generated is a good example of a mature colonial trade that grew steadily but not spectacularly, even if its associated proxy of the African slave trade did experience a predictably positive impulse at the end of the war. Even in comparatively booming Scotland trade growth rates during the posited "Boom Decade" were consistently slower than during the war. The only discrepancy to this picture of gradual rather than accelerating growth concerns total English imports, which showed some significant acceleration in CAGR between 3.9% and 4.7%, depending on the specific measure used. This apparent paradox can be explained, however, by the realisation that this "foreign" trade data does not distinguish between genuine overseas trade and bilateral trade between England and Scotland: some of these growing English "imports" included a sizeable proportion of the more rapidly expanding Scottish re-exports.

Table 1. Aggregate economic trends, 1762-72 and 1755-62

	"Boom decade" (1762-72)				"Seven Years War" (1755-62)				"Displacement"	
	Total	**CAGR**	AAGR	Std Dev	Total	CAGR	AAGR	Std Dev	**Δ(CAGR)**	1762-3
Hoffman (industry, excluding building)	31.4%	**2.8%**	2.9%	6.4%	-6.3%	-0.9%	-0.8%	4.4%	**3.7%**	-3.1%
Hoffman (industry, including building)	16.9%	**1.6%**	1.6%	0.3%	2.0%	0.3%	0.3%	0.5%	**1.3%**	1.6%
Crafts-Leybourne-Mills (Amended)	28.2%	**2.5%**	2.6%	4.5%	-8.7%	-1.3%	-1.2%	4.8%	**3.8%**	7.0% [(a)]
Crafts-Leybourne-Mills (Revised)	17.0%	**1.6%**	1.6%	3.5%	2.0%	0.3%	0.3%	3.5%	**1.3%**	5.6% [(a)]
Broadberry et al. (Nominal)	17.9%	**1.7%**	1.7%	3.3%	14.3%	1.9%	2.1%	5.8%	**-0.3%**	5.2%
Broadberry et al. (Real)	3.8%	**0.7%**	0.4%	2.4%	11.4%	1.6%	1.6%	3.0%	**-0.8%**	-0.3%
Broadberry et al. (Real, Agriculture)	-6.8%	**-0.7%**	-0.2%	10.7%	18.4%	2.4%	2.7%	7.8%	**-3.1%**	1.1%
Broadberry et al. (Real, Industry)	19.0%	**1.8%**	1.9%	5.3%	0.8%	0.1%	0.2%	3.2%	**1.6%**	0.4%
Broadberry et al. (Real, Services)	-2.3%	**-0.2%**	-0.2%	2.7%	17.7%	2.4%	2.4%	2.3%	**-2.6%**	-2.2%
S-G price index (all consumer goods)	24.5%	**2.2%**	2.3%	4.9%	2.2%	0.3%	0.6%	8.2%	**1.9%**	6.4%
S-G price index (non-cereals)	14.4%	**1.4%**	1.4%	3.1%	2.3%	0.3%	0.4%	3.2%	**1.0%**	2.2%
S-G price index (producer goods)	-3.9%	**-0.4%**	-0.4%	2.7%	12.1%	1.6%	1.7%	2.7%	**-2.0%**	0.0%

[(a)] Two year return (1762-4)

Primary data input sources (author's calculations): Rows 1-2 Mitchell, *British Historical Statistics*, pp. 431**.** Rows 3-4 Crafts & Harley, 'Restatement', pp. 725-7. Rows 5-9 Broadberry et al., 'British Economic Growth, 1270-1870', dataset https://www.nuffield.ox.ac.uk/users/Broadberry/Nov2011FinalData1270-1870.xlsx, Rows 10-12 (including composition of indices), Mitchell & Deane, *Abstract*, pp. 347 & 469.

Table 2. Textile production trends, 1762-72 and 1755-62

	"Boom decade" (1762-72)				"Seven Years War" (1755-62)				"Displacement"	
	Total	**CAGR**	AAGR	Std Dev	Total	CAGR	AAGR	Std Dev	**Δ(CAGR)**	1762-3
Retained raw & thrown silk imports [(a)]	140.8%	**9.2%**	14.2%	42.4%	-40.6%	-7.2%	7.0%	62.4%	**16.4%**	127.9%
Retained raw cotton imports [(b)]	72.3%	**5.6%**	18.6%	56.3%	-21.6%	-3.4%	0.1%	29.2%	**9.0%**	-14.5%
English linen piece good exports	50.0%	**4.1%**	5.2%	15.5%	133.0%	12.8%	14.8%	21.4%	**-8.7%**	-1.8%
Scottish linen stamped for sale (yards)	15.9%	**1.5%**	1.7%	6.5%	39.5%	4.9%	5.0%	6.6%	**-3.4%**	9.7%
Scottish linen stamped for sale (value)	22.1%	**2.0%**	2.3%	8.8%	37.7%	4.7%	4.9%	7.6%	**-2.7%**	16.2%
Scottish linen exports (yards) [(c)]	-0.3%	**0.0%**			112.9%	11.4%	15.5%	35.7%	**-11.4%**	
Scottish linen exports (value) [(c)]	5.1%	**0.5%**			111.8%	11.3%	15.3%	34.9%	**-10.8%**	
Printed goods stamped for duty	63.2%	**5.0%**	5.3%	8.4%	13.9%	1.9%	2.8%	14.9%	**3.1%**	4.9%
Hides and skins charged with duty	1.5%	**0.2%**	0.2%	4.3%	11.0%	1.5%	1.5%	2.8%	**-1.3%**	-2.2%

[(a)] Raw silk imports + thrown silk imports – silk exports
[(b)] Raw cotton imports – raw cotton re-exports
[(c)] Figures for 1763 and 1769 missing

All figures for England and Wales only, unless otherwise specified.

Sources: Rows 1-5, 8-9: Mitchell & Deane, *Abstract*, pp. 177-8, 184, 200-1, 206, 266. Rows 6-7, Hamilton, *Economic History*, p. 410.

Table 3. Metals and mining trends, 1762-72 and 1755-62

	"Boom decade"				"Seven Years War"				"Displacement"	
	Total	**CAGR**	AAGR	Std Dev	Total	CAGR	AAGR	Std Dev	**Δ(CAGR)**	1762-3
White Tin (volume)	22.3%	**2.0%**	2.3%	7.3%	-6.3%	-0.9%	-0.8%	6.0%	**3.0%**	5.9%
White Tin (value)	19.8%	**1.8%**	2.1%	7.9%	-9.7%	-1.5%	-1.2%	8.5%	**3.3%**	12.6%
Copper ore sold at public ticketings	72.0%	**5.6%**	6.9%	17.3%	13.4%	1.8%	2.2%	9.6%	**3.8%**	11.2%
Lead and shot exports	16.2%	**1.5%**	2.6%	15.8%	9.7%	1.3%	2.2%	15.2%	**0.2%**	3.7%
Iron imports (total)	29.6%	**2.6%**	4.2%	17.4%	1.7%	0.2%	2.2%	22.0%	**2.4%**	17.5%
Iron exports (total)	75.9%	**5.8%**	8.7%	24.9%	-4.3%	-0.6%	0.5%	15.7%	**6.4%**	23.4%
Steel exports	107.5%	**7.6%**	10.6%	28.3%	-23.5%	-3.7%	2.1%	35.2%	**11.3%**	2.1%
Pig iron production (total) [(a)]	9.6%	0.9%	1.0%	3.0%	17.4%	2.3%	2.4%	3.4%	**-1.4%**	-1.0%

[(a)] Charcoal plus coal-fired furnaces.

All figures for England and Wales only, unless otherwise specified.

Sources: Rows 1-8, Mitchell & Deane, *Abstract*, pp. 140-44, 154, 156-7, 169. Row 9, Feinstein & Pollard, *Capital Formation*, pp. 80-1.

Table 4. Brewing and distilling production trends, 1762-72 and 1755-62

	"Boom decade"				"Seven Years War"				"Displacement"	
	Total	**CAGR**	AAGR	Std Dev	Total	CAGR	AAGR	Std Dev	**Δ(CAGR)**	1762-3
Hops	-59.4%	**-8.6%**	94.8%	220.2%	-34.6%	-5.9%	11.7%	81.3%	**-2.7%**	-3.1%
Malt	6.0%	**0.6%**	2.3%	19.8%	-6.9%	-1.0%	0.9%	22.0%	**1.6%**	-24.6%
Strong Beer	-0.3%	**0.0%**	0.0%	1.8%	3.0%	0.4%	0.6%	5.8%	**-0.4%**	-1.1%
Small Beer	-14.0%	**-1.5%**	-1.5%	2.8%	3.0%	0.4%	0.5%	4.1%	**-1.9%**	-6.3%
British Spirits (England)	-21.6%	**-2.4%**	-1.6%	12.5%	-37.0%	-6.4%	-2.2%	29.2%	**4.0%**	-27.8%
British Spirits (Scotland)	28.8%	**2.6%**	3.5%	14.4%	-91.0%	-29.1%	-20.7%	35.0%	**31.6%**	-18.6%
British Spirits (Ireland)	9.5%	**0.9%**	5.2%	33.4%	39.2%	4.8%	23.9%	65.1%	**-3.9%**	-3.6%

All figures for England and Wales only, unless otherwise specified.

Sources: Rows 1-4, Ashton, *Economic History*, pp. 240-2. Rows 5-7, Mitchell & Deane, *Abstract*, pp. 255-6.

Table 5. Miscellaneous production trends, 1762-72 and 1755-62

	"Boom decade"				"Seven Years War"				“Displacement”	
	Total	**CAGR**	AAGR	Std Dev	Total	CAGR	AAGR	Std Dev	**Δ(CAGR)**	1762-3
White Glass	40.0%	**3.4%**	3.6%	6.3%	31.6%	4.0%	4.3%	8.3%	**-0.6%**	-2.0%
Common bottles	12.1%	**1.2%**	1.4%	6.8%	-17.7%	-2.7%	-2.2%	11.2%	**3.9%**	8.4%
Paper (England)	25.1%	**2.3%**	2.3%	4.3%	16.4%	2.2%	2.2%	2.9%	**0.1%**	0.2%
Paper (Scotland)	81.3%	**6.1%**	6.5%	9.6%	97.3%	10.2%	10.7%	11.2%	**-4.1%**	9.1%
Soap	4.1%	**0.4%**	0.4%	1.2%	1.7%	0.2%	0.3%	2.3%	**0.2%**	0.7%
Tallow Candles	-2.5%	**-0.3%**	-0.2%	2.7%	23.8%	3.1%	3.2%	4.0%	**-3.4%**	-1.2%
Starch	-3.8%	**-0.4%**	3.6%	30.8%	9.9%	1.4%	4.1%	26.7%	**-1.7%**	-1.1%

All figures for England and Wales only, unless otherwise specified.

Source: Mitchell & Deane, *Abstract,* pp. 263-7.

Table 6. Investment trends in roads and waterways, 1762-71 and 1755-62

	"Boom decade" (1762-71)				"Seven Years War" (1755-62)				"Displacement"	
	Total	**CAGR**	AAGR	Std Dev	Total	CAGR	AAGR	Std Dev	**Δ(CAGR)**	1762-3
Total (Great Britain)	30.6%	**3.0%**	3.1%	4.8%	11.5%	1.6%	1.7%	4.6%	**1.4%**	1.2%
Turnpikes (total)	52.6%	**4.8%**	5.3%	10.4%	23.1%	3.0%	3.2%	5.9%	**1.8%**	15.0%
Turnpikes (England & Wales)	45.5%	**4.3%**	4.7%	10.7%	23.1%	3.0%	3.1%	5.7%	**1.2%**	15.2%
Turnpikes (Scotland)	47.6%	**4.4%**	4.8%	9.8%	23.5%	3.1%	3.3%	7.5%	**1.4%**	14.3%
Parish Highways (total)	0.9%	**0.1%**	0.1%	1.7%	0.2%	0.0%	0.0%	0.7%	**0.1%**	1.4%
Parish Highways (England & Wales)	0.8%	**0.1%**	0.1%	1.7%	0.4%	0.1%	0.1%	0.7%	**0.0%**	1.3%
Parish Highways (Scotland)	2.3%	**0.3%**	0.3%	2.0%	-2.2%	-0.3%	-0.3%	0.8%	**0.6%**	2.3%
Bridges (total)	27.9%	**2.8%**	9.9%	43.0%	186.7%	16.2%	31.7%	69.2%	**-13.5%**	-32.6%
Canals (total)	295.4%	**16.5%**	26.5%	45.7%	248.0%	19.5%	65.3%	151.3%	**-3.0%**	-4.6%

Source: Feinstein and Pollard, *Capital Formation*, pp. 197-8, 205, 217.

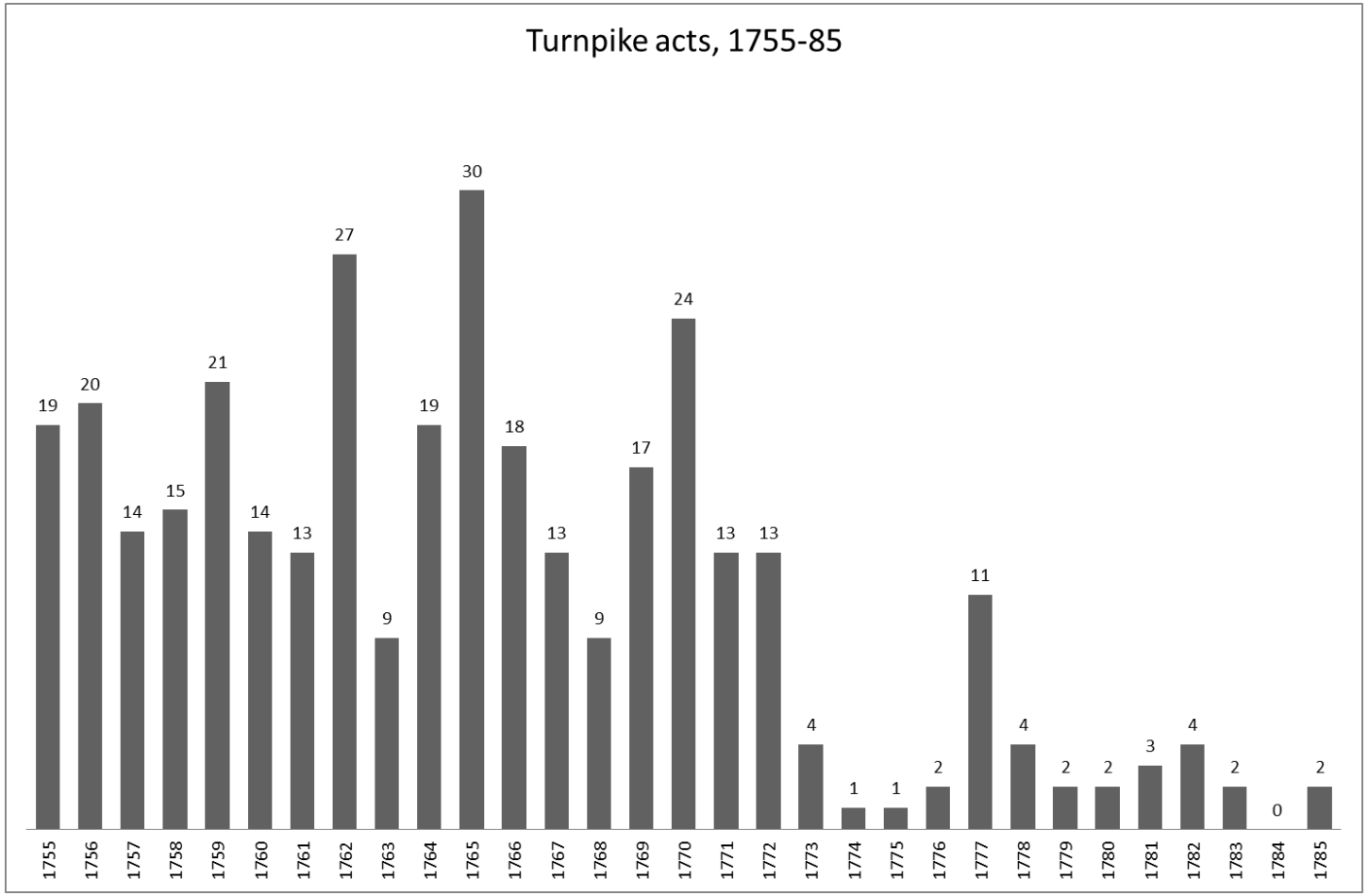

Figure 3. Turnpike Acts passed by Parliament, 1755-85. Source: Albert, *Turnpike Road System,* Appendix B.

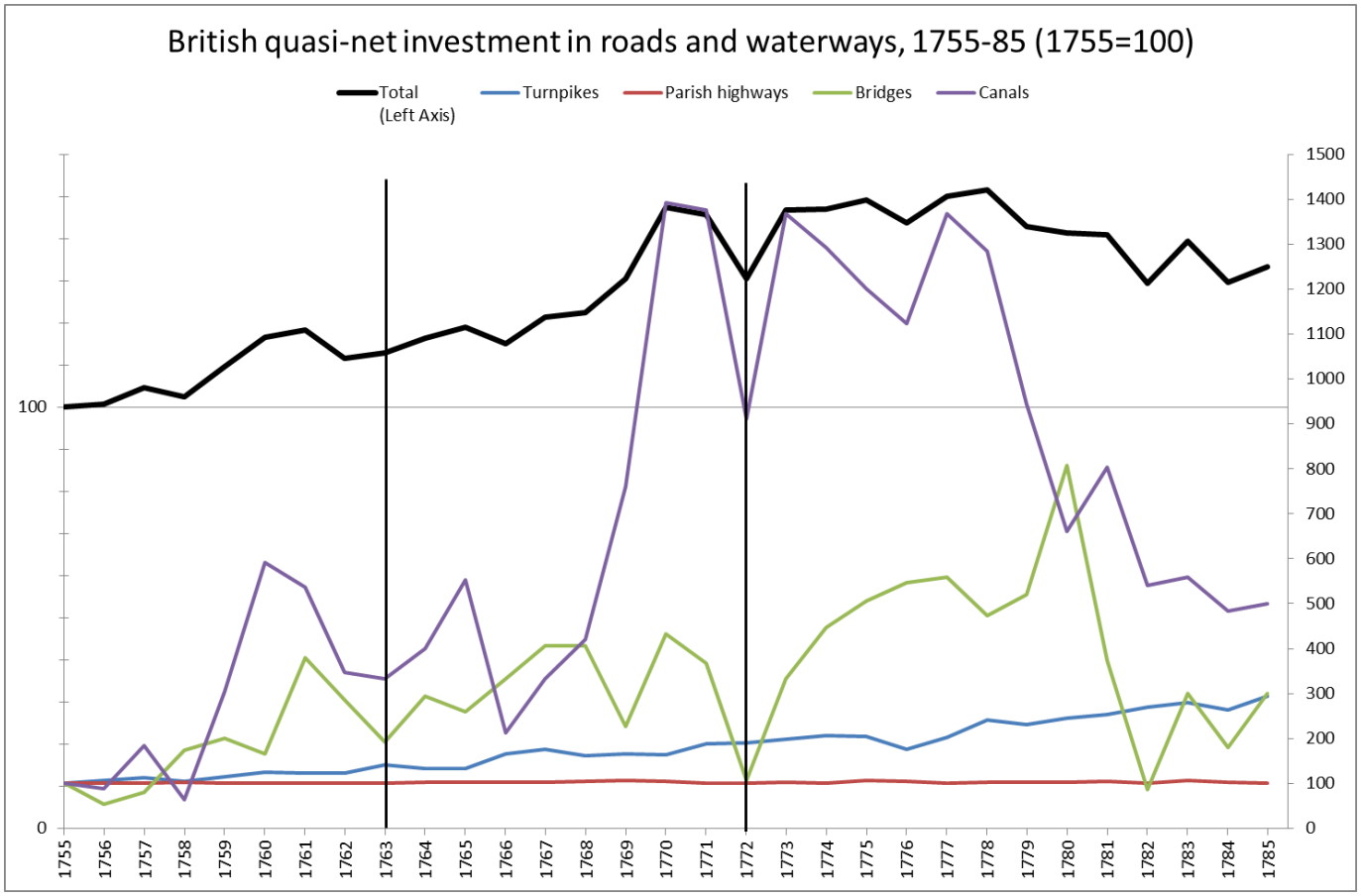

Figure 4. Investment trends in roads and waterways, 1755-85 (normalised: 1755=100). Individual trends plotted on the right hand axis, totals on the left hand one. Source: as per Table 6.

Table 7. General trade and specific colonial commodity trends, 1762-72 and 1755-62

	"Boom decade"				"Seven Years War"				"Displacement"	
	Total	**CAGR**	AAGR	Std Dev	Total	CAGR	AAGR	Std Dev	Δ(CAGR)	1762-3
Total English imports (first cost)	50.0%	**4.1%**	4.4%	8.9%	1.6%	0.2%	0.7%	10.2%	**3.9%**	26.3%
Total English imports (c.i.f.) [(a)]	56.8%	**4.6%**	5.0%	10.1%	-0.5%	-0.1%	1.3%	18.0%	**4.7%**	29.7%
Total English re-exports	30.0%	**2.7%**	3.6%	13.8%	38.1%	4.7%	5.0%	8.7%	**-2.1%**	18.3%
Total English exports	11.7%	**1.1%**	1.6%	11.2%	18.8%	2.5%	2.8%	9.2%	**-1.4%**	1.3%
Total Scottish imports	70.9%	**5.5%**	6.1%	11.8%	52.3%	6.2%	7.7%	19.8%	**-0.7%**	27.5%
Total Scottish exports	56.3%	**4.6%**	5.1%	11.4%	86.5%	9.3%	10.2%	14.6%	**-4.7%**	9.3%
Sugar imports (volume, England)	32.3%	**2.8%**	4.8%	20.8%	13.9%	1.9%	3.3%	19.2%	**1.0%**	30.5%
Sugar imports (volume, Scotland) [(b)]	105.9%	**7.5%**			21.3%	2.8%			**4.7%**	
Sugar imports (value, England)	21.7%	**2.0%**	3.4%	17.2%	22.1%	2.9%	11.9%	52.5%	**-0.9%**	21.3%
Sugar imports (value, Scotland) [(b)]	105.1%	**7.4%**			21.9%	2.9%			**4.6%**	
Slave ship departures to the West Indies	76.1%	**5.8%**	6.6%	13.6%	26.0%	3.4%	5.7%	19.9%	**2.5%**	34.8%
Slave ship arrivals to the West Indies [(c)]	50.4%	**4.2%**	5.2%	16.2%	2.7%	0.4%	1.7%	25.5%	**3.8%**	44.2%
Tobacco imports (volume, England)	16.8%	**1.6%**	3.9%	23.7%	-10.2%	-1.5%	1.7%	28.5%	**3.1%**	47.7%
Tobacco imports (volume, Scotland) [(b)]	69.5%	**5.4%**			75.7%	8.4%			**-3.0%**	
Tobacco imports (value, England)	16.7%	**1.6%**	3.7%	22.6%	-10.2%	-1.5%	15.6%	71.8%	**3.1%**	47.6%
Tobacco imports (value, Scotland) [(b)]	69.4%	**5.4%**			75.9%	8.4%			**-3.0%**	

[(a)] Cost, insurance and freight
[(b)] Figures for 1763 and 1769 missing
[(c)] Periods offset by one year forward (hence the column groups should read: 1763-73, 1756-63, and 1763-4) to capture delay in sailing ship arrivals

Sources: Rows 1-4, Dean & Cole, *British Economic Growth*, Appendix I, pp. 320-1. Rows 5-6, 8, 10, 14, 16, Hamilton, *Economic History*, pp. 414-9. Rows 7, 9, 13, 15, Boody Schumpeter, *English Overseas Trade Statistics*, Tables XVI, XVII. Rows 11-12, *Voyages: The Trans-Atlantic Slave Trade Database* (http://www.slavevoyages.org).

The potential role of finance in inflating a 1763-72 bubble

Bearing in mind the reservations about the sometimes dubious quality and non-representative nature of the data, not to mention the extreme simplicity of the methodology employed to analyse it, we can still conclude from the preceding section that the patterns of growth for the period 1763-72 do *not* constitute an unequivocal macroeconomic displacement signal. That does not imply that the economy was stagnant: most sectors for which data survive grew more or less healthily, and some particular ones (such as textiles, mining, and canal construction) could be even characterised as buoyant. But the picture is never uniform even within narrow sectors, while the correlation of any growth dynamic with the end of the Seven Years War is not especially strong. In some cases the prevailing rates of growth during the so-called 1763-72 "boom" were not materially different from, and in fact were occasionally lower than, those prevailing during the war. In others the dynamic predated 1763 by some time, for instance in the case of Scottish colonial trades where the trend originated in the late 1740s rather than 1763. When it comes to 1763 itself, there is always the possibility that any positive displacement arising from the signing of the Peace of Paris was partly or wholly counterbalanced by the negative effects of the Continental financial crisis taking place at the same time. The end of wartime finance and the monetary contraction caused by Prussia's sudden revaluation of its currency may have been imported to Britain and dampened any euphoria there – even if euphoria at the victory was indeed present, which considering the unpopularity of the treaty in some parts of the British press is far from certain.[29]

A Minsky bubble could have yet resulted if the post-1763 period was characterised by an overly rapid financial expansion, especially if its object were the

[29] Colley, *Britons*, pp. 102-18.

aforementioned speculative new industries. Simply put, there are two broad interconnected functions for finance. The first is the channelling of capital from savings to investment: fixed and circulating (working) capital for businesses, and consumption capital (including housing) for individuals. The second is operational: the provision of saving facilities, the facilitation of long distance payments, and the provision of monetary surrogates in lieu of, or in addition to, specie. Modern literature is equivocal over the role of finance in providing fixed capital to mid-eighteenth century British industry. Although Britain was already one of the richest countries in Europe, the accumulation and reinvestment of private savings into industry may have been "crowded out" by the Government's frequent needs for wartime credits. Government debt was abundant, liquid, and secure, while the rise in consol yields during wartime made them more attractive by comparison with the expected rates of return and perceived risk of investments in agricultural improvement or new industries.[30] In the period under observation, the British Government built up large deficits during the Seven Years and American wars, with an interlude of small surpluses between 1766-76 (Figure 5). Consol yields were highly correlated with the amount of outstanding Government debt, dropping almost one full percentage point at the end of the Seven Years War and remaining steady until 1776 at around 3.4% (Figure 6). It is thus possible that as state needs for credit were scaled back and consol yields became less attractive to investors after 1763, more capital could have been diverted to private investment.[31]

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[30] This simple loanable funds argument is presented in more detail in Neal, 'Finance of business', pp. 154-5. Temin and Voth, *Prometheus Shackled*, pp. 167-8, demonstrate a strong negative correlation in the lending practices of several London private banks (Child's and Hoare's) with the borrowing requirements of the Government . See also Williamson, 'Why was British growth so slow?' and Mokyr, 'Has the industrial revolution been crowded out?' for a discussion on crowding out, though one focusing on the Napoleonic Wars rather than the period under investigation here.

[31] See Sussman and Yafeh, 'Institutional reforms', for a study on the correlation of the political environment with that of the interest the British Government had to pay in this period. See also North & Weingast, 'Constitutions and commitment', for perhaps the best known exposition of this tradition, and Coffman et al., *Questioning credible commitment*, for a challenge to it.

In itself this is not sufficient as a potential displacement impulse, as *demand* for fixed capital arguably remained modest, even after large-scale machinery became more widely available for major industrial activities such as coal mining.[32] Instead, there was a more pressing need for circulating capital and the facilitation of payments, particularly so for foreign trade where outlays and receipts could be significantly out of phase in an era of sailing ships and horse-drawn carriages. Tobacco importation is a good example of such a relatively capital-intensive commercial activity in this period, and one which moreover displayed the apparent paradox of its being increasingly dominated by Scottish merchants.[33] It is also a prime candidate for being part of a bubble in the real economy, being concentrated in exactly the same geographical area and among the same merchant community that the Ayr Bank operated. Scottish success, however, was not a result of better access to abundant capital or a financial mania of any sort. As we have seen, the trend existed well before the new, supposedly reckless, lending of the likes of the Ayr Bank could have been a factor; it is anyway a stretch to even imagine that the meagre financial resources of Scotland could have been responsible for forming a bubble, especially when compared to her much larger and richer neighbour. The growth of the Scottish market share of the trade was rather founded on the cost advantage Scots importers enjoyed over their English competitors, partly due to the cheapness of locally produced manufactured goods that were supplied to the colonists in exchange for tobacco,[34] but more importantly because of the organisational advantages of their operations in America.

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[32] Postan, 'Recent trends in the accumulation of capital', Pollard, 'Fixed capital', Pressnell, *Country Banking*, pp. 322-43*,* Mathias, *Transformation of* England, 88-109**,** Temin and Voth, *Prometheus Shackled*, pp. 148-75, Cameron, *Banking in the early stages of industrialization,* p. 36-8, Flinn, *Coal Industry*, pp. 192-3.

[33] Price, *Capital and Credit*, p. 124.

[34] Hamilton, *Economic History,* pp. 259, has estimated that £100 of Glasgow goods purchased £230 of tobacco in Virginia, although this margin may have incorporated the advantageous exchange between sterling and the Virginia currency.

The tobacco trade with Britain followed two distinct business models.[35] The older system, usually adopted by London traders and involving the produce of large plantations, was the "plantation" or consignment system. This involved the colonial planter arranging for a British trader to assume the costs and risks of storing and marketing his entire crop in Europe (though not those associated with shipping and insuring it) in exchange for a commission. The merchant in turn arranged for the purchases of manufactured and consumer goods required by the planter and shipped them by return vessel. Any deficit (as was usually the case) between the price of the crop and that of the European goods was financed by the British merchant and secured on the planter's personal bond. The newer "commercial", or store-based, system, which became increasingly prevalent among Glasgow traders after 1750, involved dispatching factors to America as "supercargoes", or recruited them among many the Scottish emigrants in the colonies. They in turn set up stores in the colonies which purchased tobacco directly from planters and sold European goods to them on credit. Title to the crop passed to the factor on purchase, and all freight and insurance costs for transportation to Europe were assumed by the store. As with the case of the consignment system, any deficit incurred by the planter was financed by the British store owner and secured on land mortgages. Planters, both under the consignment and commercial systems of trade, generally ran credit balances with their British counterparties for at least twelve months which required periodic rolling-over, although store credit generally consisted of numerous small sized debts compared to the larger balances run in the consignment trade. The commercial system became increasingly popular as it proved better suited to the needs of smaller farmers and planters; by 1775 over three-quarters of Virginia tobacco were traded under it.[36] The reason for this was once again cost: Scottish

[35] Sheridan, '1772 and the American colonies', pp. 168-71, Soltow, 'Scottish traders in Virginia', pp. 83-98, Land, 'Economic behavior in a planter society'.
[36] Sheridan, '1772 and the American colonies', p. 169

ships achieved much quicker turn-around times due to the presence of their affiliated factors on the spot, who could arrange for the shipment of the produce of the smaller planters they traded within a more flexible manner than for the case of large consignments. Shipping to Glasgow rather than London also enjoyed the advantage of a round-trip that was shorter by four to six weeks, and which followed a route that was mostly immune to hostile action in case of war, unlike the Channel route typically used by English importers. Since freight charges could range from a third to a half of the prime cost of tobacco, the savings achieved by Glasgow merchants were substantial, and allowed them to be much more competitive in the prices they offered to planters.[37]

It has been estimated that an investment of four times the cost of each hogshead of tobacco imported was necessary for the store system to function, not only because of the capital expenditure required in setting up the network of overseas stores, but also due to planters running chronic deficits with their European counterparties. A contemporary estimate put it that £55,000 in goods and credit needed to be invested for an annual import rate of 2,200 hogsheads, at the time selling for £6 each.[38] These capital requirements may have been partly behind the consolidation of the industry to a few large firms, which fell from 91 in 1728-31 to only 38 in 1773.[39] Some of these firms, like John Glassford & Co., or the Buchanan and Cunninghame groups of interconnected partnerships, were large concerns with tens of established stores in America and turnovers in the hundreds of thousands of pounds.[40] Finance may have played a part in aiding this consolidation, and it certainly provided the payment facilities and short-term liquidity (especially through the discounting of bills of exchange) for the industry to expand.

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[37] Hamilton, *Economic History,* p. 259. Price, 'Rise of Glasgow', pp. 187-90.
[38] Devine, *Sources of capital*, pp. 116-7.
[39] Hamilton, *Economic History,* p. 266.
[40] Soltow, 'Scottish traders in Virginia', p. 85, Hamilton, *Economic History,* p. 266.

In other words, a mania could have still ensued after 1763 if the prevailing credit and monetary conditions "fanned the flames" of a convincing growth narrative with sufficient vigour – even for a case where the initial spark was as apparently innocuous as economic growth during the not-so-booming 1760s. More specifically, financial mechanisms could have destabilised the system in four ways:

1. Through an equity-led expansion, spearheaded by the establishment of speculative projects like the celebrated "Bubble Companies" of 1719-20.[41]

2. Via a credit bubble in long- or short-term debt, and directed to either (or both) consumption or industrial investment.

3. Through a rapid monetary expansion through the extensive use of paper money, or of short term money-market instruments like bills of exchange.

4. By constructing such financial connections as to enable the rapid transmission of an exogenous shock across the financial network; in other words, by providing vectors of financial contagion.

These mechanisms are neither mutually exclusive nor necessarily independent of each other. Credit growth may well be speculative, often irrationally so; indeed, in the 1760s it is supposed to have been just that. Equity-funded projects can be backed by investors following a rational momentum investment strategy, or by a "mad crowd" gripped by an "irrational frenzy", or by naïve newcomers to the market exploited by corrupt insiders. Similarly, elaborate chains of bills of exchange could serve (indeed as we will see, *did* serve) as short-term money market instruments, as monetary surrogates in lieu of specie, and as vectors of contagion once the shock hit.

[41] The true nature of these supposedly frivolous projects has been re-examined in later literature and their comparative importance questioned. See for instance Hoppit, 'Myths of the South Sea Bubble'.

Equity growth

The greatest part of equity capital available to businesses in this period originated in the ploughing-back of retained earnings. This was (and remains) a method that was by definition limited by the firm's profitability and, by construction, not suitable for start-up capital. Conventional equity and debt were necessary for the latter. The raising of new equity was however legally constrained in England through the provisions of the 1720 Bubble Act,[42] which forbade the establishment of joint-stock companies without the prior authorisation of an Act of Parliament or a Royal Charter. A further restriction specific to financial institutions arose from the monopoly provisions of the Bank of England Act of 1708,[43] which forbade the establishment of any banking corporations and restricted private banking partnerships to a maximum of six partners. This legal framework practically confined most businesses to the status of unincorporated private partnerships. Such entities had no separate legal personality from their partner-owners, nor a managerial hierarchy separate from them. There was no easy transferability of equity stakes, and partnerships did not have a perpetual existence like modern incorporated firms do. Death, retirement, or a change in status by one of the partners (for instance through bankruptcy) could lead to the end of the partnership and the need for it to be set up again from scratch. As partners were the legal party in any contracts struck by the firm and had to be named in litigation, they were ultimately liable for its debts in an unlimited manner. Unlimited liability remained the universal condition of

[42] 6 Geo. I, c. 18. The following presentation of the English business legal framework closely follows Harris, *Industrializing English Law*, pp. 14-36. For the effects of the Bubble Act see Harris, 'The Bubble Act: its passage and its effects on business organization', Patterson and Reifen, 'The effects of the Bubble Act on the market for joint-stock shares'.

[43] 7 Anne, c. 30.

private firms until the Limited Liability Act of 1855.[44] In this period there were no limited partnerships with "sleeping partners" only liable for their equity stake.

Scotland enjoyed a somewhat more flexible regime. Although in principle the Bubble Act applied there as well, the observation of its provisions was more cursory, while the BOE monopoly did not extend north of the Tweed.[45] Scots could form unincorporated companies of more than six partners, including for banking, and could in theory escape the practical equity capital restrictions imposed on their English counterparts. These larger Scottish "co-partnerships" were however *not* the same as joint-stock companies in that their shares were not freely transferrable. Nor were they established in perpetuity: their duration was typically limited between 7 and 21 years.[46] Finally, although the issue of a separate legal personality for such companies was an unresolved rather than an unequivocal fact,[47] the unlimited liability of partners was still the universal rule.

Non-bank joint-stock corporations could still be established according to the provisions of the Bubble Act, while entities like the EIC, the BOE, and the South Sea Company had been prominent parts of the business landscape for decades. The corporation concept pre-dated the Bubble Act, having arisen from the medieval concept of the Crown granting privileges to groups, such as townships, universities, ecclesiastical institutions, and guilds. In contrast to partnerships, corporations had separate legal personalities from their proprietors. This directly implied that they

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[44] 18 & 19 Vict., c. 133.

[45] R. H. Campbell, 'The law and the joint-stock company in Scotland', Freeman et al., ' Different and better?'.

[46] Munn, *Provincial Banking Companies*, pp. 5-6**,** makes an arbitrary (by his own admission) distinction between "partnerships" for those companies having fewer than 13 partners, and "co-partnerships" for those having more than 13. To prevent confusion with private partnerships of the English type, the present discussion will instead put this arbitrary limit at *six*: any Scottish unincorporated companies of more than this number of partners will be referred to throughout as "co-partnerships".

[47] As will be seen in Chapter 5 the Ayr Bank affair would later play an important role in better defining it.

were continuous in their existence, could make internal byelaws, own land, and receive further privileges (such as monopolies) from the state. Their shares were freely transferrable, and could thus be traded (and speculated upon) in the secondary market. Most notably, their separate legal personality implied some measure of limited liability for their proprietors.

The most prominent case of major new joint-stock equity raising in this period was the financing of canal projects (Table 8). In addition to the Forth & Clyde and Monkland projects in Scotland already mentioned, nine more canals were initiated in England between 1755-71. With the exception of the Duke of Bridgewater navigations which were financed through the Duke's estate (in itself a form of profit plough-back), the other eight were undertaken according to the provisions of the Bubble Act.[48] In total, almost £700,000 were committed by the proprietors of these projects, who came from a diverse part of the country and a broad section of society, from peers, to manufacturers, merchants, and even widows and tenant farmers.[49] Nevertheless, not all this equity was paid-up at the time of incorporation; the schedule of calls on proprietors for portions of their total commitment followed closely the progress of construction in a manner akin to modern "project finance". Therefore, although £700,000 in stock capital may have been *eventually* committed, only a fraction of that was actually invested before 1772.

The other signature transportation project in this period, the turnpike, involved a third type of business organisation: the trust. Trusts were often concerned with land, with proprietors holding formal title and beneficiaries having its use, which made them ideal for turnpike projects. In practical terms, trusts fell somewhere between partnerships and corporations: though limited in their lifespan

[48] Ward, *Finance of canal building*, p. 18.
[49] For a social classification of proprietors see Ward, *Finance of canal building*, pp. 18-26.

in the way of partnerships, they could attract more than six subscribers. For the case of turnpike trusts specifically, these subscribers financed the project through debt rather than equity, even though the establishment of the trust still required the passage of an enabling Act of Parliament.[50] After 1750, turnpike trusts increasingly obtained contractual commitments from subscribers prior to the passage of their enabling Acts in a manner similar to joint-stock equity subscriptions.

Parliamentary approval was also a prerequisite (by definition) of parliamentary enclosure, another growing activity in the 1760s. Of the nearly 5300 enclosures enacted by Parliament after 1750, over 37% fell between 1755 and 1780,[51] and there was an observable peak during our "Boom Decade" (Figure 7). Nevertheless, it has been disputed that enclosure required substantial investment either of equity or of mortgage debt. It seems that much of the process was instead financed through sales of a portion of the land being enclosed. This could not have been a financial operation that would have easily led to the growth of a bubble, being by construction self-limiting: there was a finite amount of land that could have been sold, and land prices would have anyway fallen in case of a land glut caused by an enclosure "mania". Land sales were also painful enough to both landlords and tenants as to make psychological euphoria equally unlikely. Nevertheless, any substantial monetary contraction could still affect the process of enclosure, through a lack of wherewithal to effect such land sales. Figure 7 does indeed seem to point to such a retrenchment in the early 1780s, a pattern that is closely correlated to the unsuccessful turn in the American War and the aligning of several major European powers against Britain after 1778.

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[50] For instance Martins Bank was involved in the financing of some turnpike projects: Chandler, *Four centuries of banking*, p. 151.

[51] Turner, 'Cost, finance, and parliamentary enclosure', p. 237. For more on enclosure, particularly its financing aspects, see Blum, 'English Parliamentary Enclosure', Buchanan, 'Financing of Parliamentary Waste Land Enclosure', and Turner, *English Parliamentary Enclosure: its historical geography and economic history*.

It is difficult to estimate whether there was a substantial increase in the 1760s in the amounts of new equity capital raised in those sectors of the economy that were dominated either by individuals or by private partnerships. The restrictions of the Bubble Act and those examples that do survive can provide some idea of a rough ceiling for the amounts involved, and are especially evident in the structure of the quintessentially capital intensive business of banking. The special case of the BOE aside, banks were not lavishly capitalised operations - the six partner rule, even if it came to six very rich partners, was just too restrictive. The London bank of Barclay, Bevan and Bening (one of the precursors of modern Barclays Bank) had £20,000 in equity all through the 1760s; Goslings, a merchant bank with notable East India connections, had only £9,000 in 1773, though this may have been an artefact of its change of partner share structure that year; Mason, Currie, James and Yallonby (better known as Curries Bank) was the best capitalised example for whom shareholders' equity figures survive, having £30,000 in 1776.[52] Country banks were of similar scale: the Bristol Old Bank (Lloyd, Elton, Miller, Tyndall, Gillam & Edye - one of the earliest English country banks) was well capitalised with £27,000 in 1773; the Newcastle Old Bank on the other hand had only £2,000 at the peak of the supposed bubble in 1771.[53] The historian of English country banking, L. S. Pressnell, has plausibly estimated an average of £10,000 in shareholders' equity for country banks of this era.[54] For London banks the £16,000 of the emblematic 1772 firm, NJFD, can be considered as typical.[55]

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[52] BGA 364/1-40 & 78-84, BGA 130/729-734, RBS CU/118.

[53] RBS MCB/1/1, Pressnell, *Country Banking*, p. 519.

[54] Pressnell, *Country Banking*, pp. 226-7. The Lincoln country bank of Smith, Ellison and Brown, whose London correspondents were Smith, Payne and Smith, started on 24 April 1775 with £3,000 capital (RBS SEC/92/1).

[55] TNA B1/61, fos 23-8, petition by Mary Roffey, widow and executor of Samuel Roffey Esq., deceased, in the matter of Henry Neale, William James, Alexander Fordyce, and Richard Down, bankrupts, 1 May 1773.

In principle, the somewhat looser Scottish legal regime could have allowed for more rapid equity growth of private banks, though the comparative poverty of the country and the initial hostility of the chartered Edinburgh banks to new banking co-partnerships limited such opportunities somewhat.[56] The Dundee Banking Company was established in 1763 by 36 founding partners with £12,600 of subscribed capital, which was comparable to that of Coutts Bank, a Scottish-owned private partnership in London with £12,000 in partners' equity through most of the 1760s.[57] The Perth United Banking Company's resources were larger at £32,000 in its founding year of 1766, and that of the Banking Company of Aberdeen even more substantial at £98,000 and 197 founding partners in 1767.[58] Above all others, the Ayr Bank was founded in 1769 with £96,000 of subscribed capital and 136 founding partners, rising to £163,000 and 237 respectively by the time of its stoppage in June 1772. As with the case of the canal companies however, these were only notional commitments, and the actual paid-up equity could be substantially lower. The Ayr Bank's partners had been called for only 65% of their commitments (a little over £104,000) by the time of the crisis, three years after the bank's foundation.

All too often the partners of private banks were merchants or manufacturers who had branched out into banking as a means to finance their primary business. Equally often it was that business that provided them with the start-up capital and the regular cash flow stream on which they built and grew their banking activities.[59] A typical example were the founding partners of NJFD, two of whom had originally been brewers.[60] Sir Richard Glyn of Glyn & Halifax had originally been a dry-salter.[61]

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[56] Munn, *Provincial banking companies*, pp. 10-16.
[57] COU, Balances for 1763-1793.
[58] Checkland, *Scottish Banking,* pp. 112-5.
[59] Crouzet, *Capital formation*, pp. 163-88.
[60] Specifically Henry Neale and Samuel Roffey. The latter sold part of his stake to Richard Down in 1769 and subsequently died in 1770 (TNA B1/61 fos 23-8).
[61] Joslin, 'London private bankers', pp. 182-3. Charles James of Curries Bank has been erroneously identified by Hilton Price, *Handbook of London bankers*, pp. 46-7, and in consequence by Joslin as

Start-up banking capital could also become available to those whose professional or public function entailed the warehousing of funds, such as officers of the Revenue or legal professionals like scriveners who were involved in the conveyance of property.[62] The best example of this sort in 1772 is John Fordyce of Ayton, Berwickshire, a distant cousin of NJFD's Alexander Fordyce and brother-on-law to the Duke of Gordon.[63] Leveraging his position as Receiver-General for Scotland, this Fordyce rapidly grew his banking business with a partnership in Edinburgh and a corresponding house in London.[64]

The only practical way that a broad equity-led bubble could have grown in the 1760s would have been either through large share capital increases for joint-stock companies, a proliferation of new private partnerships by absolute number, or a major increase in the retained earnings of existing companies (both private and joint-stock) that could be then ploughed back into the business. Again, it is difficult to produce reliable representative figures for any of this. Joint-stock companies with freely traded shares in the secondary market could always raise new equity capital by selling stock, after appropriate Parliamentary approval. In Scotland, both the Bank of Scotland and the Royal Bank were to do just that, but only did so *after* the 1772 events.[65] A bullish stock trading environment, like that prevailing in East India stock between 1766-9, could have helped attract prospective shareholders in expectation of increased dividends. Even though it is plausible that the East India share trading saga may have led to the 1772 crash, it is more likely to have done so via a

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above, as one of Alexander Fordyce's partners, who was to join that company in 1773. Fordyce's partner was in fact named William.

[62] Pressnell, *Country banking*, pp. 36-44, and 'Public monies', Mathias, 'The lawyer as businessman'.

[63] The Duke had married Fordyce's sister. The literature occasionally confuses the two kinsmen, e.g. Watson, *Reign of George III*, pp. 62, 167.

[64] Fordyce, Malcolm & Co. and Fordyce, Grant & Co. respectively. As will become evident in the discussion in Chapter 4, the business connections of this Fordyce may have been as pivotal in the transmission of the 1772 crisis as those of his more notorious cousin.

[65] Checkland, *Scottish Banking*, pp. 142-8, Saville, *Bank of Scotland,* p. 166.

conventional secondary trading mania rather than a Minsky bubble initiated by a major injection of new equity capital to "speculative" and "Ponzi" economic units.[66]

As far as a possible proliferation of new partnerships goes, banking is again one of the growth areas for which we have a clearer picture. With country banks becoming established in both England and Scotland after 1740, numbers were definitely rising. Joslin estimated that the number of London private banks grew by almost 50% between 1754 and 1770 (Figure 8).[67] Pressnell mentioned 'crops of new [country] banks in the early fifties, in 1765-6 [and] in 1770-1', but could not provide accurate statistics for this period beyond an estimate that the total number of English banks of both types stood at around 150 in 1776.[68] There is better detail when it comes to Scottish banking as its scale was much smaller. From a situation before the 'Forty Five when the whole system essentially consisted of the two older Edinburgh chartered banks, by 1772 there were 31 banks in total: 3 were chartered "public" banks, 19 were private partnerships of the English type and all but one located in Edinburgh, and 9 were provincial co-partnerships, including the newly established Ayr Bank.[69] This was undoubtedly a growth industry, and although we only have the rough impressions on the equity capitals committed in it as outlined above, it did attract a fair amount of it. Rondo Cameron's very rough estimates for this period use Pressnell's £10,000 average for each of the 100 country banks and his own estimate of £30,000 for each of the 50 London private ones, bringing the total equity capital committed in banking alone at £2.5 million.[70] Since Cameron used the outlier of Currie's bank as representative of London bank capitalization, his estimates are however almost certainly overstated. As discussed earlier, a figure nearer half

[66] This will be discussed in more length in the following chapter.
[67] Joslin, 'London private bankers', p. 173.
[68] Pressnell, *Country Banking*, p. 6. Pressnell's detailed statistics as shown in ibid, Table I, p. 11, start only in 1784.
[69] Checkland, *Scottish Banking*, p. 135.
[70] Cameron, *Banking in the early stages of industrialization*, pp. 32-3.

that would be more appropriate, bringing the total equity commitment in this sector to £1.75-2 million at most. Another £500,000 was committed in Scottish banks by 1772, with the Ayr Bank's ample capital resources making up over a fifth of this.[71] That said, there is nothing to imply a particularly abnormal, or bubble-like, growth. It cannot be ruled out that other sectors of the economy, particularly in industry, might be growing more dramatically than that, but there is a marked lack of contemporary reports on such an industrial partnership "frenzy". What numbers do survive are modest: the Carron ironworks, as major a new industrial undertaking as any, were founded by seven partners committing an initial share capital of £12,000 in 1759.[72] The four industrial examples given by François Crouzet (the brewers Truman, Hanbury & Buxton, and the foundries of Coalbrookdale, Cheadle Brass, and Walker & Co.) show figures of similar magnitude: Truman was the only one that was well capitalised at £23,000 in its foundation year of 1741; Coalbrookdale was set-up with £2,800 in 1709, Cheadle Brass with £3,600 in 1734, and Walker & Co. with a mere £600 in 1746.

Retained earnings and additional contributions from existing partners could help a company grow, but such growth was ultimately capped by the profitability of the company and the personal wealth of the partners, which in turn determined what fraction of these profits could be taken out as dividends. Growth could still be vigorous: Crouzet's four examples displayed an average annual equity growth of 3.68%, 4.17%, 4.95% for Truman, Coalbrookdale and Cheadle Brass respectively, and a spectacular 16.92% for the initially tiny Walker & Co. Much more instructive than simple growth rates, however, is the realisation that the initially well capitalised

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[71] Checkland, *Scottish Banking,* p. 235. Checkland may have used subscribed rather than paid-up capital, as evidenced by his assignment to the Ayr Bank of its full nominal £130,000 rather than the little over £104,000 it actually had called by the time of its stoppage. For this reason it is advisable to round his figure of £526,000 down to half a million pounds at most.

[72] Campbell, *Carron Company*, p. 123. The growth of industrial capital is a very major subject but figures in this era are sparse and insecure. Feinstein and Pollard's seminal analysis begins in 1750.

Truman excepted, the other three enterprises had not reached more than £30,000 in capital stock each by 1770.[73] Truman was indeed a major company by this date with over £100,000 in accumulated capital, a figure that was comparable to that reached by the more famous Carron Company. In January 1769, Sir Charles Gascoigne calculated that in ten years after its establishment the Carron partners had paid in an additional £62,000; inclusive of nominal interest on these shareholder contributions and after subtracting dividends paid out, the capital account had grown above £85,000 and continued to do so afterward.[74] Three years later, just as the credit crisis struck, the company wrote to the two older Edinburgh chartered banks asking for assistance and describing how the company '[employed] at Carron a Capital of One Hundred Thousand Pounds & upward paid in by the partners'.[75] Even so, the company considered itself significantly undercapitalised for the projects it was undertaking and the expansion it was envisaging. This shortfall was calculated by Gascoigne at over £80,000 in his 1769 calculations. Some of this he attempted to make up through a 10% call on existing partners, which however did not prove fruitful. He therefore had to turn to the second, and arguably greater, method of raising capital: debt.

[73] Crouzet, *Capital formation*, pp. 198-200**.** Crouzet's earlier findings from 'La formation du capital en Grande-Bretagne pendant la Révolution industrielle', *Second International Conference of Economic History,* Aix-en-Provence, 1962 are summarised in a slightly different manner by Cameron, *Banking in the early stages of industrialization,* p. 40.
[74] Campbell, *Carron Company*, pp. 128-30.
[75] RBS RB/12/11 p.75, 15 July 1772.

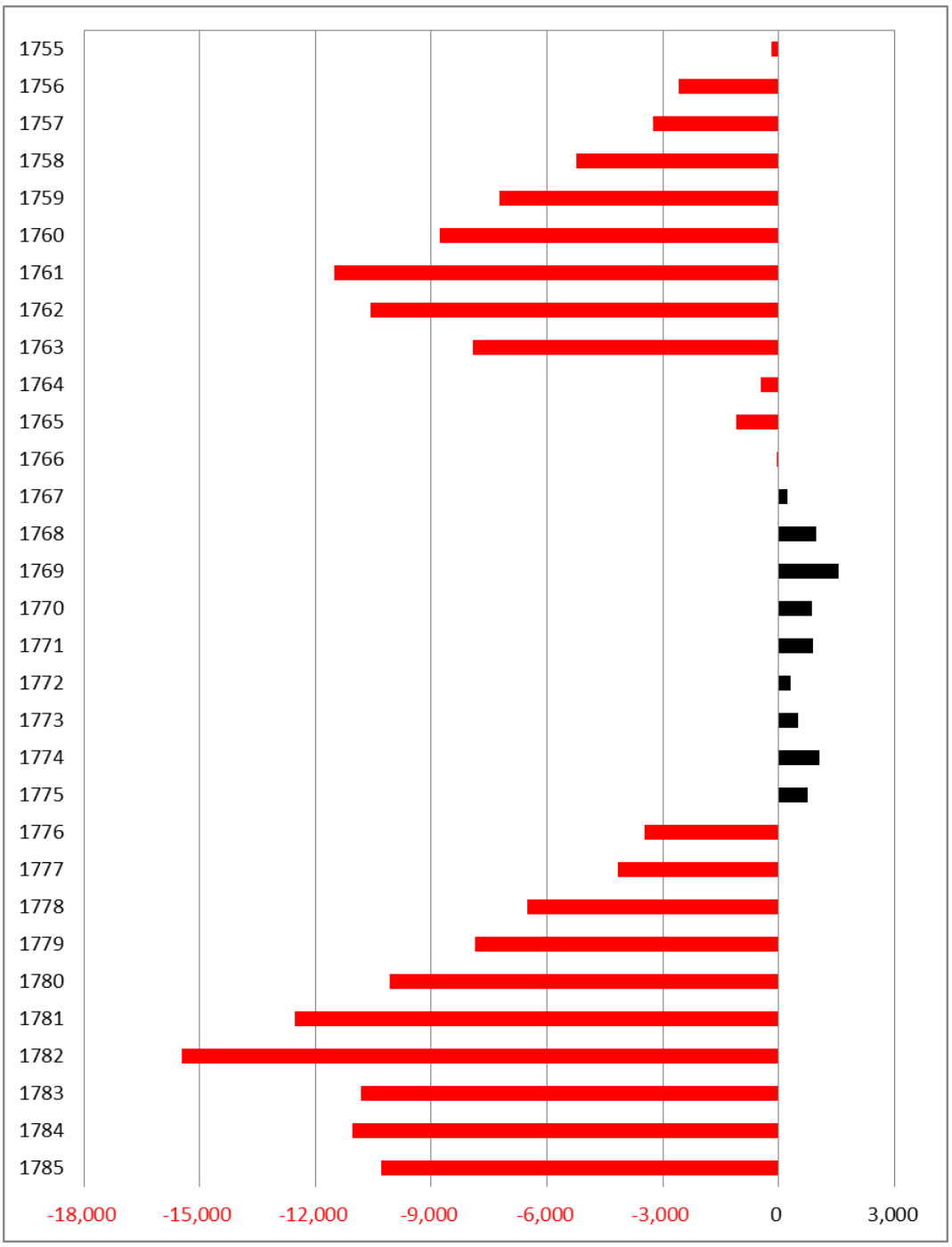

Figure 5. Total Government budget balance (total net income less total state expenditure) for Great Britain, 1755-85, in thousands of pounds sterling. Source: Mitchell and Deane, *Abstract,* pp. 387-8 & 390-1.

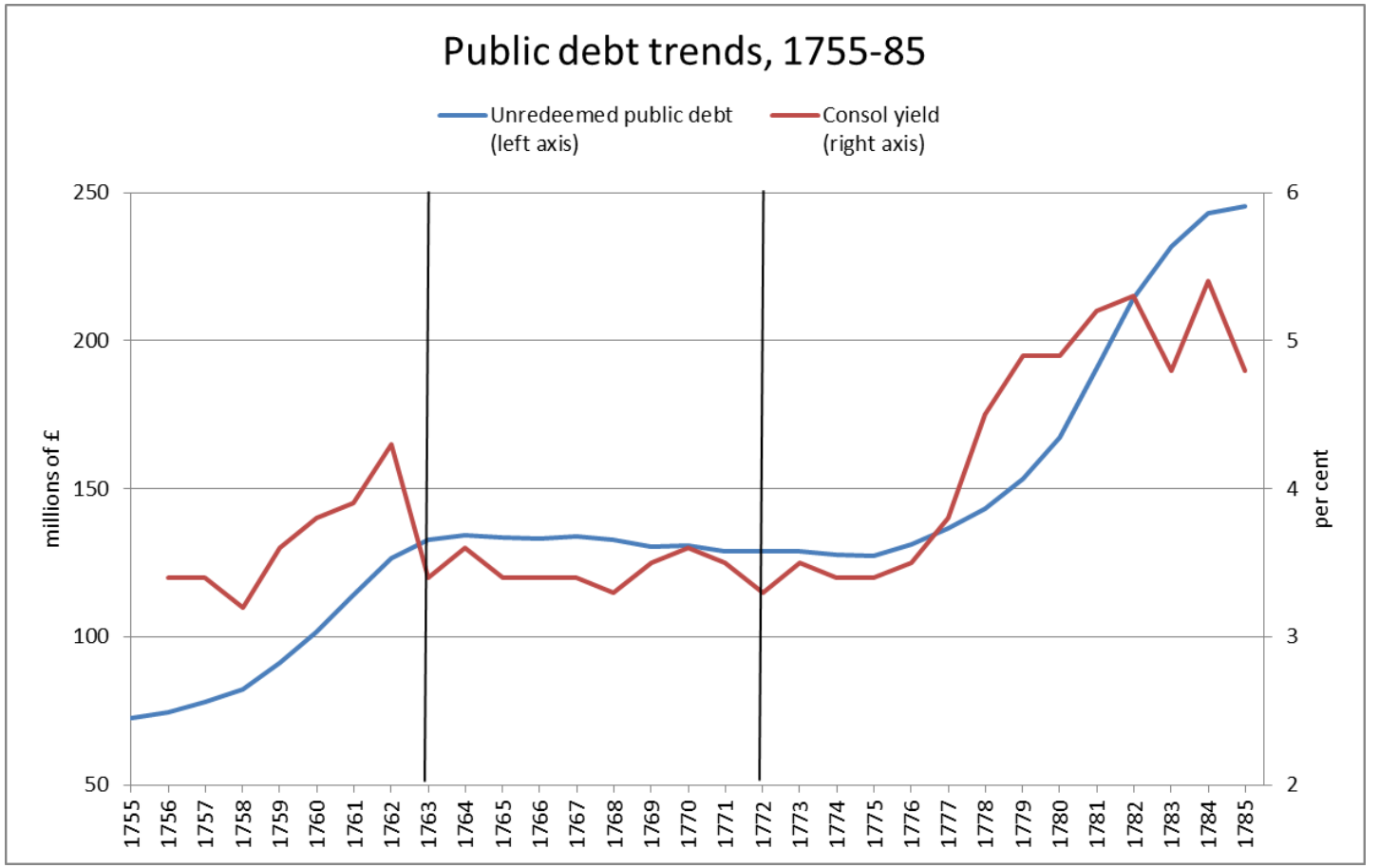

Figure 6. Total nominal public debt outstanding (left axis) and prevailing consol yield (right axis), 1755-85. Note: consol yield data start at 1756. Source: Mitchell and Deane, *Abstract*, pp. 390-1 (outstanding debt), p. 455 (consol yield).

Table 8. Capital structure for major English canal projects, 1755-72

	Year of incorporation	Year of completion	Subscribed equity at launch	Authorised equity (if different)	Number of shares	Nominal share price	Loan capital (1755-71 only)
Sankey Navigation	1755	1761	18,600		120	155	-
Duke of Bridgewater Navigation [(a)]	1759	ongoing		total pre-1780 investment > £300,000			25,000 [(b)]
Trent and Mersey Canal	1766	1777	86,900	130,000	655	200	166,600 [(c)]
Staffordshire and Worcestershire Canal	1766	1772	98,000		700	140	-
Birmingham Canal Navigations	1768	1798	70,000		500	140	-
Coventry Canal	1768	1790	50,000		500	100	-
Oxford Canal	1769	1790	141,200	150,000	1412	100	-
Leeds and Liverpool Canal	1770	1816	172,400	260,000	1919	N/A	-
Chesterfield Canal	1771	1777	55,000	100,000	N/A	N/A	50,000

[(a)] Non-joint stock project
[(b)] Loan by Child & Co., London, repaid in 1769
[(c)] Three loan tranches in 1770, 1775 and 1776, no details on distribution of funds between them

All monetary amounts in pounds sterling

Source: Ward, *Finance of canal building,* pp. 26-36.

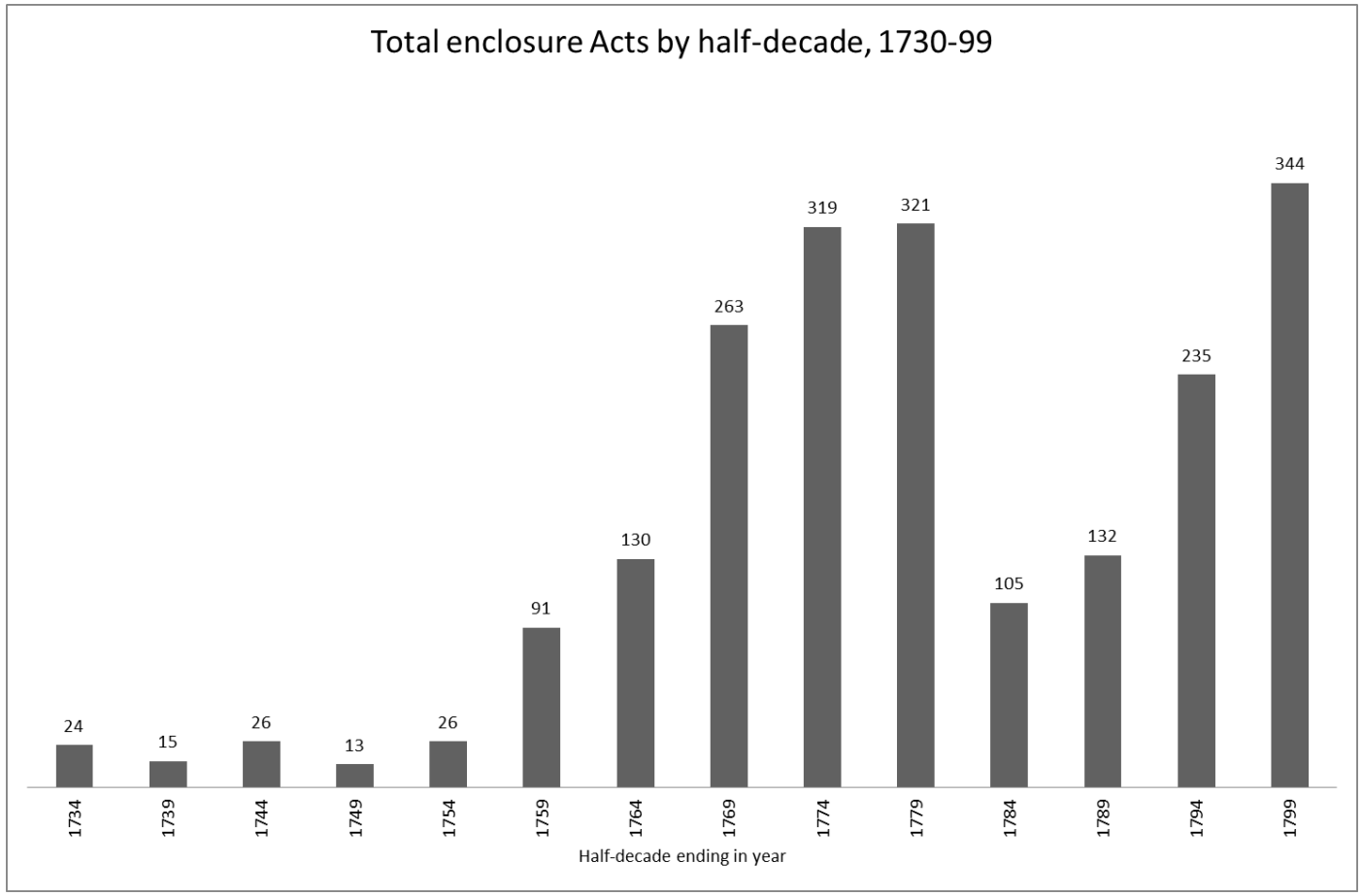

Figure 7. Total enclosure Acts of Parliament (arable plus waste and common land), 1730-99 by half-decade totals. Source: Turner, *Parliamentary Enclosure,* Table 10, p. 68.

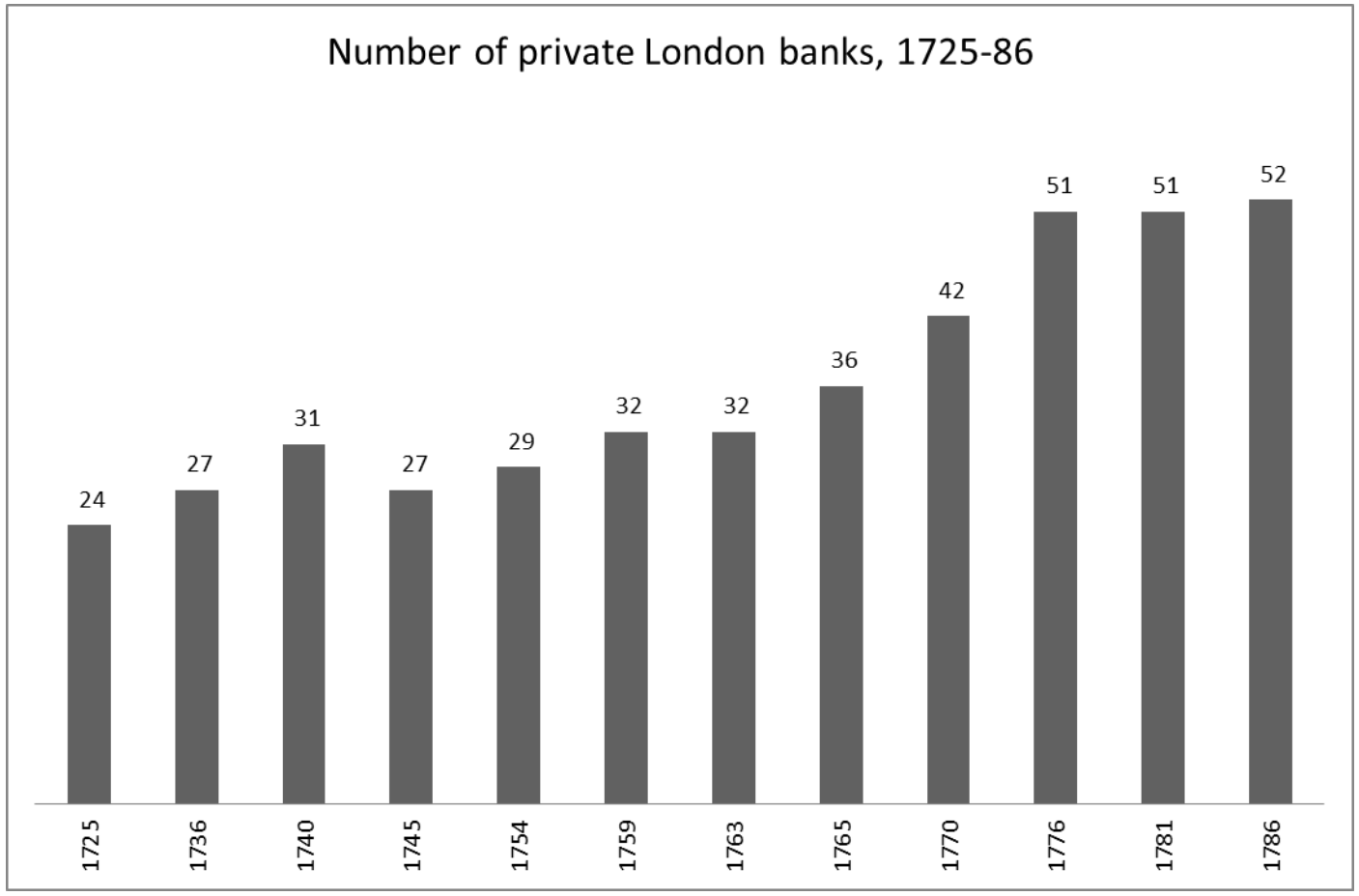

Figure 8. Estimates of total numbers of London private bankers, 1725-86. Source: Joslin, 'London private bankers', p. 173.

Credit growth

As with the case of equity and the Bubble Act, the amount of debt that a firm could raise in this period was also practically restricted by the law, though in this case implicitly rather than explicitly. Between 1713 and 1832, usury laws forbade the taking of interest above 5 per cent per annum.[76] This hard ceiling made debt markets 'more rigid in price and less certain in supply',[77] and thus less efficient. This could become a serious problem at times when real interest rates rose above this nominal interest ceiling, such as during a credit crisis like the one in 1772, or when wartime government finance "crowded out" private borrowers. In such cases, potential creditors would not find an adequate return for the risk they were asked to incur, and could accordingly retreat from the market leaving otherwise perfectly creditworthy potential debtors without a reliable source of funds. There were of course ways to circumvent the usury restriction, just as there had always been. The most notable one in 1772 was the issuance of redeemable annuities. These were personal (and thus non-transferrable) debt obligations, sometimes perpetual but more often linked to the lifespans of one or two named beneficiaries. As implied by the term, annuities were usually redeemable at the option of the borrower who could at any point refund the principal to the creditor. The taking of interest was not explicit and therefore not subject to the usury laws. The creditor purchased the specific annuity stream from the borrower for a lump sum paid up front. This purchase sum could vary with the abundance or scarcity of money, as well as with the perceived risk of the borrower, thus effectively allowing the implied interest rate to float according to prevailing market conditions. Annuities were not a panacea, being a legal grey area, and through their non-transferability not as convenient as

[76] Mainly 13 Anne, c. 15. See also Persky, 'From usury to interest'.
[77] Mathias, *Transformation of England*, p. 92.

other credit instruments. Nevertheless, they remained an outlet that allowed the credit market to clear at times of distress.[78]

In another similarity with equity capital, the lack of a separate legal personality for private partnerships, and the state of unlimited liability for partners, meant that the distinction between personal and commercial credit was never clear-cut. This was as true of the origination of debt as it was of its use. It was individual partners who more often than not borrowed the funds and provided the necessary security for them. This security also tended to be personal in nature, and as such could also draw from a store of personal goodwill and informal favours obtained by individual partners in addition to contractual obligations. This informality sometimes extended to the relationship between borrowers and creditors, the latter of whom could occasionally be invited to enter the partnership in an ad hoc debt-to-equity swap.[79] The line between private and company use of the funds thus raised was likewise blurred. This was especially so for sums raised as working capital, which could be instead directed towards the private consumption of partners, or their private investments and speculations. Although there could be recourse to the law when such cases became blatant, there were also occasions when nothing was done against such partners. For instance, neither Alexander Fordyce nor Sir George Colebrooke were ever prosecuted for speculating with their banks' capital in 1772.

When it came to more recognisably commercial credit, corporate bonds for larger companies already existed, though they required parliamentary approval before they were issued. East India bonds were a well established and popular instrument by this time,[80] and the Ayr Bank's liquidators also issued transferrable bearer bonds in the process of the company's protracted unwinding. The sums

[78] Campbell, 'Usury and annuities', Poterba, 'Annuities in Early Modern Europe'.
[79] Mathias, *Transformation of England*, p. 92.
[80] Marco & Van Malle-Sabouret, 'East India bonds'.

involved for these rare bond issues could be large: the bond issuance for the Ayr Bank was for £500,000. Conventional bank credit was more usual, though still far from ubiquitous. At the top of the banking system, the BOE was still very much a private company rather than the "central bank" it would become after 1844, but it was by no means a major agent of industrial and commercial investment. Since its foundation in 1694 the Bank had been primarily concerned with the financing of government, and by the middle of the Eighteenth Century was also increasingly concerned with the health of the financial system as a whole. Its private business consisted of some deposit taking for wealthy individuals and, especially, the discounting of bills of exchange for merchants in good standing. Discounting was by its very nature a short-termist operation, as bills of exchange never extended beyond three months in maturity. The Bank never lent money against illiquid long-term mortgage security, at least under normal conditions.[81]

In Scotland there were three "public" (that is, chartered) banks located in Edinburgh. The Bank of Scotland ("the Old Bank") had been established by Act of Scottish Parliament in 1695, while the Royal Bank of Scotland ("the New Bank") was established by Royal Charter in 1727. They were later joined by the British Linen Bank, originally a company trading in textiles, which was chartered in 1746 and entered the business of banking in the 1750s.[82] Though there were three of them, the Scottish public banks did not compare with the BOE either in size, resources, or monopoly privileges. The Bank of Scotland had in fact been explicitly barred from government finance through its very founding Act.

The private banking partnerships that stood below the BOE were not uniform in their business model, but followed their own specialisation and comparative advantage. Goldsmith banks like the Childs, Hoares, Drummonds, and Martins, often

[81] Chapter 4 will demonstrate that in a crisis the Bank would readily break this "rule".
[82] Checkland, *Scottish Banking*, pp. 23-104, Lythe, *Economic history*, pp. 150-5.

but not exclusively based in the West End of London, tended to serve the needs of the landed aristocracy and made a big point of their conservative manner of conducting business.[83] "Merchant" London banks like Prescott Grote., Glyn & Hallifax, Sir George Colebrooke & Co., and NJFD, were usually based in the heart of the City and catered to a commercial clientele (Table 9).[84] There were finally those with a foot in both camps like Barclays, originally a goldsmith bank that later expanded its business along commercial lines, and Goslings, whose physical location at Fleet Street corresponded to its hybrid nature halfway between the West End and City banks. Its customers included the gentry, local lawyers, publishers, and authors - Edward Gibbon had an account and a mortgage with them. More notably for the purposes of this discussion, Goslings had strong connections with the EIC dating all the way back to Diamond Pitt. Sir Francis Gosling was one of Clive's financial agents, and some of the most prominent nabobs of this period were its customers. In 1762 a cousin of Lord Clive was admitted in the firm at the retirement of a previous partner.[85]

The aggregate consumption of bank credit in this period is not easy to measure either directly, or through proxies like bankruptcies and other credit-related litigation. When it comes to credit availability one can employ surviving balance sheets and profit and loss (henceforth: P&L) statements to obtain some impression of its trends. It must be stressed that the same reservations about the completeness and representative nature of the available primary data discussed in the previous chapter apply even more strongly to surviving financial evidence from this period. Records are sparse and do not simultaneously or continuously span the

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[83] Joslin, 'London private bankers', p. 177. The customer ledgers RBS CH/315/3-4 confirm this customer profile.

[84] The premises of NJFD were situated in Lombard Street; Colebrooke & Co. were at Threadneedle Street, virtually a stone's throw away from the BOE (Hilton Price, *Handbook of London Bankers*, pp. 40-1, 104).

[85] Joslin, 'London private bankers', pp. 177-8. BGA 130/720-4 and 130/665-671.

period in question. Not all surviving accounts include both balance sheets and P&L statements for the same firm simultaneously, and not all necessary information required to construct comparable financial ratios is available for all firms. Therefore the various tables and graphs presented here will each be populated by different component firms, as surviving data allows. Analysis is further hampered from an absence of a common accounting standard. Although accounting manuals such as the *Universal Accountant* were available in this period,[86] and most ledgers did follow the conventional double entry accounting standard, in practice private partnerships were under no obligation to publish their financial results in the manner of modern public corporations, and as such could follow any convention their partners preferred. This is especially evident when it comes to the terminology employed, which is not always comparable between contemporaneous firms, or even consistent for the same firm during different periods. The term "Sundries" in particular could mean different things from firm to firm, and from year to year, and could describe items either on the debit or credit side of the ledger, or indeed both simultaneously. Similarly, P&L accounting did not always make a clear distinction between gross and net revenue, or between net revenue and dividends paid out to partners.

Figure 9 presents the normalised asset growth for four banks whose accounts fully span the 1755-85 period.[87] Figures for Coutts & Co. exclude cash reserves, as these have not survived. Coutts and Goslings were the most vigorously expanding of the four, showing asset growths of 500% and 300% respectively by the time of the 1772 crisis. Figure 10 presents the same data in absolute terms (in fact in logarithmic scale, since Childs Bank dwarfed the rest in size), and adds the three Scottish

[86] Gordon, *Universal Accountant*.

[87] Joslin, 'London private bankers' refers to several of those sources, particularly those for Childs and Goslings whose records are by far the richest and best maintained. His figures resemble those listed here very closely.

provincial banking co-partnerships that came into existence in the 1760s. These are the only seven firms whose surviving accounts overlap the 1772-3 crisis. This figure also confirms the rapid asset growth of Coutts and Goslings, which allowed them to reach (and in the case of Goslings, overtake) Barclays in the absolute magnitude of their assets. It also demonstrates how a mere four years after its inception the Aberdeen co-partnership, drawing upon its 197 partners, could rapidly approach the total asset level of long-established Barclays, which was restricted by the six partner rule.

Table 10 summarises the growth rate trends of bank assets for the posited "Boom Decade" of 1762-71 and the war period that preceded it. This shows no apparent global trend of broad based credit expansion which would justify the formation of a bubble. Two firms (Barclays and the Perth Bank) only showed minimal asset growth. Childs expanded by almost 7% annually, while Coutts, Goslings and the Dundee Bank grew vigorously at about 12% per annum. For the four banks whose results completely span the period we can produce basic estimates of displacement in 1763. Once again the data present a diverse picture. Coutts showed no step-change at all, but consistently grew its balance sheet at the same rapid rate. Barclays may have displayed a small jump in 1763, but it was nothing as dramatic as the acceleration of asset growth shown by Childs and Goslings. This is unsurprising when it comes to Goslings, considering its significant connections to the EIC and the Clive family. Its business appears to have benefited from the successful conclusion of the war in India and the award of the *diwani* to the EIC. Finally, Table 11 presents the balance sheet of the Ayr Bank at the time of its stop of payments. In a little over two years as a going concern this byword of Scottish credit excess had indeed grown a substantial asset base of over £1.2 million, making it almost 60% larger by assets than the largest English private bank, Childs.

These isolated figures can be then compared against a rough projection of the overall level of private banking assets for the whole country. This can be arrived at by multiplying the shareholder equity estimates derived in the previous section with an average leverage factor (total assets over shareholders' equity). Unlike industry where ploughing-back of retained profits was probably the rule, surviving P&L data for banks shows a tendency to distribute the vast majority of their net profits as dividends to partners. As a result, shareholders' funds remained broadly steady over a number of years, unless the partnership line-up was changed through death, retirement, or the admission of a new partner. Therefore, fluctuations in leverage can be assumed to be a good proxy for measuring corresponding fluctuations in banking assets.

Table 12 presents such leverage factors for nine banks for whom figures survive over segments of the 1755-85 period. Only one of these, Barclays, completely spans this period. Three of the four Scottish co-partnerships established in the 1760s also supply continuous, though not fully spanning, data. The solitary figure for Goslings is an outlier that almost certainly overstates its leverage, since it arises from a date when the company was in the process of changing its partner and capital make-up. Similarly, the first three years just after the foundation of the Dundee Bank also appear to overstate the firm's usual leverage and to be an artefact of the firm's building up of its core business.

A usual problem with financial data from this period is survivorship bias, with failed companies not represented as a rule, but for this case there is also some information for three of the stopped companies of 1772-3. There is a single data point for the Ayr Bank at the time of its stoppage on 24 June 1772 obtained directly by the balance sheets produced afterwards by the bank's liquidators. The leverage factor for NJFD on the other hand is a very rough estimate. Although the firm's bankruptcy commission documents have survived, they only concern themselves

with the *liabilities* of the company – no asset information has survived other than a snippet of its physical inventory valuation.[88] Liabilities should of course by construction be mirrored by assets, balanced by the appropriate P&L. The problem for NJFD is that these P&L numbers are missing; we only have the firm's start-up capital in 1763, but no further information on shareholders' funds after that. Reports in the press about the size of Fordyce's losses varied widely and cannot be used with any degree of confidence. Furthermore as shown in Table 13, even the liabilities are uncertain and contain a range of possibilities. As a result, the leverage of the company could have ranged from a very reasonable 9 to a decidedly risky 18, or even an outright dangerous (and very unlikely) 26. The time series for the third of the failed companies for whom data survive, the Anglo-Dutch firm of John Daniel & Maurice Dreyer, are also less than dependable. It is unclear whether the surviving ledgers for this firm are for the whole or for part of its business. This firm also appears to have had a substantial "off-balance sheet" business in trading accommodation bills with Dutch counterparties.[89] For this reason, their apparent leverage factor as shown in Table 12 may be understated.

With all this in mind, a leverage between 4 and 12 for mature banks seems to have been typical in the 1763-72 period, with 12 being the "peak boom" figure just before the crisis. Taking an average between 7 and 9 as representative of the English system in normal times, and multiplying that with the £1.75 - 2 million estimate for total bank equity postulated in the previous section, we can extrapolate a figure between £12.25 - 18 million for total private bank assets in England.[90] Scotland's banking system may have been as much as six times smaller, even after its significant

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[88] TNA E144/27. The total of these assets comes to £33,835.

[89] More will be said of these in Chapter 4.

[90] Cameron, *Banking in the early stages of industrialization*, p. 34, arrives at the higher figure of £20.5 million for 1775, but as mentioned earlier he may have overstated the amount of equity invested in English private banks through his use of the Curries shareholders' capital as representative of the whole system. In any event the numbers are of a comparable order of magnitude.

growth in the 1760s - as much as 11% per annum according to Cameron's estimates.[91] According to S. G. Checkland, Scottish banking assets came to a little over £3 million on the eve of the crisis.[92] Taken against his estimate of around £500,000 in bank equity, this results to a leverage factor of 6 for the whole Scottish system, even including the outlier of the Ayr Bank (at 12), all of which is consistent with the leverage figures obtained directly for the three provincial banks presented in Table 12. In total, private banking assets for the whole of Britain can be extrapolated between £15.25 and 21 million.

Not all these assets consisted of loans to the public, but included investments in long-term securities (consols, bonds, and stocks), bills of exchange on London and elsewhere, and cash reserves. Cash-to-liability ratios, that is the fraction of banking assets held as cash, are the quintessential measure of fractional reserve banking. There survive a total of twelve sets of figures, six of them overlapping with the 1772-3 crisis (Table 14 and Figure 11), which point to several discernible trends. Firstly, this ratio was very high by modern standards, occasionally exceeding 50% and even 70% at the outbreak of the Seven Years War. Secondly, the ratio for English banks tended to substantially exceed that of the Scottish provincial co-partnerships. This cautious stance stands in contrast with the English banks' apparently higher equity leverage, and might in fact imply an innate conservatism since balance sheets may still grow if banks take in more deposits but keep the cash in their tills. Thirdly, there is a strong correlation in the cash reserve policy behaviour of each firm with respect to their different customer bases. The old and conservative Childs aimed to keep a consistently high ratio, usually ranging between 30-50%, and seems to have made a conscious effort to increase it during times of political or financial distress. Prescotts and their affiliated country bank at Bristol kept a lower ratio of below 30% and 20%

[91] Cameron, *Banking in the early stages of industrialization*, p. 74.
[92] Checkland, *Scottish Banking*, p. 237.

respectively. Goslings, the hybrid, fell somewhere in between. Finally, there is a long-term declining trend over the course of the century, implying a gradually increasing risk appetite.[93] For the 1760s we can assume that an average of one-third of assets in English banks, and of one-tenth in Scottish ones, were cash or near-cash.[94] When used with the estimates from above of £15-21 million in total private banking assets, this results in a range between £11-15 million in non-cash assets for the whole of the British private banking system (Table 15).

Though these aggregate calculations remain of course approximate, they can be helpful in putting some of the individual balance sheet numbers into perspective. The first observation that can be made under this light is that even at the higher end of these estimates this remained a very modest amount. As will be seen in the following section, the money stock of the whole country at this time has been estimated at roughly double this size: around £20-30 million, most of it in specie.[95] More importantly, public credit operated on a wholly different scale. The best example to illustrate this contrast is (as usual) the Ayr Bank. Its asset growth was certainly substantial when taken against the small Scottish banking system. Excluding bills on London, which were part of its money market financing operations and of which more will be said in the following section, about £825,000 of its assets consisted of long term loans and cash accounts. This represented as much as 30% of non-cash private bank assets in Scotland, a figure that climbs to almost 45% if the whole balance sheet, inclusive of London bills, is taken into account. For the whole of Britain, the Ayr Bank's lending could have represented as much as 6-8% of non-cash private bank assets exclusive of bills of exchange, and as much as 8-11% inclusive of

[93] Horsefield, 'The cash ratio in English banks', Joslin, 'London private bankers'.
[94] Cameron, *Banking in the early stages of industrialization*, p. 87.
[95] Capie, 'Money and economic development in England', p. 224, Cameron, *Banking in the early stages of industrialization*, p. 42, Palma, 'Annual money supply over the long-run' and BOE dataset 'A millennium of macroeconomic data'
http://www.bankofengland.co.uk/research/Documents/datasets/millenniumofdata_v3_final.xlsx

them. This was doubtlessly a significant expansion of credit to have taken place in less than three years, even considering that the bank may have been backed by as much as a fifth of the total bank equity in Scotland. Taken against that, however, was the fact that the Ayr Bank was more than 25 times *smaller* than the BOE with its £31 million of assets on the same date, of which only a tiny fraction were directed into private investment.[96] Similarly, its accumulation of £825,000 in long term assets paled into insignificance when compared with the over *£60 million* rise in public debt during the Seven Years War, or of the latter's absolute size at over £130 million in 1772.[97] In the light of such figures the Ayr Bank, though probably one of the largest private banks by assets in the whole of Britain, appears as one of the largest fish in a rather small private credit pond.

In any event, the expansion of balance sheets does not necessarily imply a corresponding increase in credit risk. The high cash reserve fractions presented above already hint at a generally conservative rather than reckless banking system, and though these steadily declined over the second half of the century they did so gradually and in no way hinting at a credit mania. To make further judgement it would be necessary to investigate the distribution of non-cash assets, their maturity, the time for which they were held, their liquidity, and the security backing them. Sadly, the already sparse surviving balance sheet information becomes even sparser when it comes to detailed asset distribution. For all practical purposes only three of the banks discussed here, Childs, Goslings, and the Dundee Bank, have asset distribution records that overlap with the 1772-3 crisis, and even then they do not always contain sufficient detail; Childs' ledgers for instance only have very broad subdivisions, and do not distinguish between loans and tradeable securities. Three

[96] BOE, Balance Sheets for February 1772 and 1773, ADM7/20, fos. 17-20.
[97] Mitchell and Deane, *Abstract*, pp. 401-2.

more firms, Dimsdale, Archer and Byde, the Bristol Old Bank, and its London correspondent, Prescott, Grote & Co., have similar data but for a slightly later period.

Depending on the business model of the specific bank in question, the distribution of assets could vary widely. A conservative goldsmith bank like Childs who made the repeated point in its customer correspondence that it never discounted bills of exchange,[98] held a large proportion of its non-cash assets in the "Public Funds" – not just the ubiquitous Government debt, but also the stocks (and bonds where those existed) of the large joint-stock companies like the BOE and the EIC (Figure 12). A country bank like the one in Bristol on the other hand could hold substantial amounts in bills of exchange, both as a result of conventional discounting operations for local tradespeople, but also as part of its money market financing operations (Figure 13). Part of the Bristol Bank's assets specifically consisted of an account with its London correspondent, who in turn handled the cash flows related to the maturity of the bank's bills on London. This was a necessary alliance for a country bank in the absence of branch banking.[99] The Bristol Bank's correspondent was Prescott, Grote & Co., a relatively new City bank established in 1766. Unfortunately, this firm's balance sheets have not survived before 1780, leaving only 5 years for the interval under investigation here, and have therefore not been pictured. Instead, the distribution of assets for another firm, Dimsdale, Archer, and Byde, are shown as typical of such a corresponding London bank (Figure 14). Dimsdale in fact enter the 1772-3 narrative in another manner, having served as London correspondent for the Ayr Bank until 1771, after which they suspended that business relationship when becoming uneasy over the Scottish firm's aggressive expansion.[100] Over 60% of Dimsdale's assets consisted of bills of exchange, making them and those other banks following the same business model a precursor of the

[98] RBS CH/229, April 20, 1773, June 19, 1773, February 19, 1774, among other references in passim
[99] Pressnell, *Country Banking,* pp. 75-125.
[100] *Precipitation*, pp. 29-30 and Appendix V, pp. 54-6.

bill-brokers of the nineteenth century. Unfortunately, since none of these three firms have surviving balance sheets that extend back into the "booming" 1760s, it is not possible to determine whether they had embarked on a bills discounting mania as per the traditional 1772 crisis narrative.

The best and most detailed time series that do overlap with the crisis are those for Goslings in London and the Dundee co-partnership in Scotland. Goslings, ever the hybrid, participated in all the business lines described above, shifting between them as the business environment changed (Figure 15). Their discounting operation was however very minor by comparison with conventional loans and mortgages. The firm's major non-cash asset holdings in the pre-crisis decade instead consisted of public securities, especially East India bonds. This is consistent both with the bank's connections with prominent nabobs, and with the EIC stock bubble of 1766-9. Many, if not all, of these securities may have been purchased for the bank's customers and do not necessarily reflect the bank's own trading account. In any case, the bank and its customers rapidly reduced their East India bond positions after the bubble deflated in 1769, and indeed displayed an uncanny prescience in entirely exiting that business by the middle of 1772 when the EIC's problems came to a head.

Perhaps paradoxically, given the comparative backwardness of its economy, Scotland's banks showed themselves to be particularly innovative in this period, and even seem to have enjoyed a competitive advantage over their English counterparts in supplying capital for some sectors of the economy like the colonial trades.[101] The Royal Bank of Scotland and the Glasgow based Ship, Arms, and Thistle banks had all supported the North American tobacco trades from an early stage,[102] and some of the Ayr Bank's expansive lending was directed to firms with West Indian interests like William Alexander & Sons. Part of this capital was in the form of bills

[101] Devine, *Sources of capital*, p. 116, 'The colonial trades and industrial investment in Scotland'.
[102] Price, *France and the Chesapeake*, pp. 607-8, *Capital and Credit*, pp. 63-95.

acceptances, and another in conventional mortgages known in Scotland as heritable bonds. As can be seen in the distribution of assets for the Dundee co-partnership however (Figure 16) , by far the greatest proportion of credit consisted of the unique Scottish financial product of the cash account.[103] This was a running line of credit, much like in a modern overdraft. Since interest was only payable on the amount actually disbursed at any moment, cash accounts were particularly suitable as working capital for businesses like long-distance commerce which had a built-in time lag between outlays and receipts. *Unlike* modern overdrafts, cash accounts were secured on the personal bond not only of the account holder but of two or more co-obligants who stood as sureties for him. Although no maturity was specified in the contracts, 'cash accounts were expected to have a rapid turnover… [as much as] four times a year'.[104] Smith considered this property as a particularly valuable tool of credit risk discovery for lenders, since the pattern of drawings and repayments could supply indirect information on the viability of the underlying business.[105] On the other hand he considered cash accounts as unsuitable for consumption, or such fixed term investments that did not lead to medium term profit generation by which the loan could be discharged, like land improvement. One of the traditional, but unsubstantiated, charges against the lending practices of the Ayr Bank was exactly that much of its largesse was directed towards the construction of the New Town of Edinburgh.[106]

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[103] Munn, *Provincial Banking Companies*, p. 3, states that 'cash advances [were the Scottish banks'] main source of credit'. For the cash account see Checkland, *Scottish Banking*, p. 63, Cameron, *Banking in the early stages of industrialization*, pp. 75-6.

[104] Cameron, *Banking in the early stages of industrialization*, p. 76, quoting Boase, *Century of banking in Dundee*, p. 560.

[105] Smith, *Wealth of Nations*, II.ii.43-6.

[106] As with so many other aspects of the traditional account, this story also seems to have its root in the comments by the editor of the 1860 edition of Forbes' *Memoirs*, specifically, pp. 39-43. Hamilton, *Economic History*, p. 317, does make some convincing correlations though, especially with the fact that the plan for the New Town was approved on July 1767, and construction began

Another Scottish innovation was branch banking. The Old Bank had briefly experimented with the concept in 1696-9 and 1731-3,[107] but it was the much-maligned Ayr Bank that was to embark upon it in earnest. In addition to establishing agencies in Glasgow, Inveray, Kelso, Montrose, and Campbeltown, the bank opened three full branches from the very first day of its operation, two of them in south-west Scotland, in Ayr (the head office) and in Dumfries. This large geographical catchment area might partly explain the bank's very fast asset growth. Another reason, and one that was often repeated by contemporaries, was that the bank had moved into a credit vacuum. The centralisation of banking in Edinburgh, combined with a reluctance by the public banks to discount inland bills, had left large parts of the country chronically under-banked. South-west Scotland, where over half of the Ayr Bank's partners were based, was only served by the two small private banks in Ayr and Dumfries whose operations appear to have been very limited and who were eventually taken over by the new firm in 1771.[108] Furthermore, the Edinburgh banking establishment had actually curtailed lending after December 1768 in a response to the monetary fluctuations that beset the country all through the decade. The chartered banks had never been particularly liberal with their lending, but they now capped cash accounts to £1,000, and in May 1769 reduced this further to only £500. The discounting of inland bills and bills of exchange, never a major operation for them, was also completely suspended in July 1769.[109] This widely perceived dearth of credit was a direct inspiration behind the establishment of the Ayr Bank, whose founding statement in November 1769 explicitly and prominently advanced the aim of a credit expansion that was commensurate to the needs of economic growth. Convinced that 'the business of banking, when carried on proper principles,

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that October, two years before the foundation of the Ayr Bank in a general atmosphere of hunger for capital. In the absence of harder evidence, however, this story must be regarded as apocryphal.

[107] Munn, *Provincial Banking* Companies, p. 4, Saville, *Bank of Scotland*, pp. 109-10.

[108] John Macadam & Co, and Johnston, Lawson & Co respectively.

[109] Munn, *Provincial banking companies*, pp. 3, 29.

is of great public utility, particularly to the commerce, manufactures, and agriculture of a country', the bank's founders even chose *Pro Bono Publico* as the bank's motto.[110] Even in 1774, after the project had collapsed so spectacularly, the author of the unsigned manuscript *Case for Messrs Douglas Heron & Co.* (henceforth: *Case*) felt that this reasoning remained essentially valid:

> The Chartered and other Banks in Scotland about the year 1768 and 1769 withdrew their credits they had formerly allowed the country of Scotland within a very narrow compass, whereby the improvements in agriculture were in a great measure stopped and the manufacturers very much distressed. This encouraged many Noblemen and Gentlemen in Scotland to enter into articles of copartnery under the firm of Douglas Heron & Co. for issuing bank notes, giving out cash accounts to merchants, manufacturers and others, and for discounting inland bills.[111]

This conviction that the bank's motives were benign and its function useful for the country long survived the affair in some quarters.[112] Even Smith, though approving of the Edinburgh banks' credit policy and in general rejecting bank lending as a way to finance capital-intensive projects,[113] admitted that it was only 'in the midst of [much] clamour and distress, [that the Ayr Bank] was established… for the express purpose of relieving the distress of the country'.[114] Far from embarking in a substantial credit expansion, the Ayr Bank's lending may therefore have restored the overall credit situation back to its long-term trend. Checkland's aggregate figures are not dense enough to show the evolution of the credit environment as a comparable

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[110] *Precipitation*, Appendix I, p. 1.
[111] NAS, Buccleuch papers, GD224/178/9. This document's context makes it likely that it was authored by George Home.
[112] *Farmer's Magazine (Edinburgh),* XII (1811), pp. 110-1.
[113] Smith, *Wealth of Nations,* II.ii.65-9.
[114] Smith, *Wealth of Nations*, II.ii.73.

time series, but the possibility that credit expansion north of the Tweed was not excessive after all remains in the very least plausible.

Table 9. Distribution of claimants to the NJFD commission of bankruptcy, 1772

Claimant profession	*Claimants*	*Amount Claimed (£)*
Landowners and farmers	104	68,285
Brokers and Bankers	22	86,376
Banker	*8*	*72,563*
Cashier of the BOE	*1*	*1,915*
Broker	*10*	*10,730*
Exchange Broker	*1*	*1,025*
Stock Broker	*2*	*143*
Clergy and Urban Professionals	25	2,970
Wholesale merchants and factors	121	59,674
Retail and miscellaneous services	50	14,645
Millers and bakers	5	1,755
Brewers and distillers	21	6,404
Textile Workers	45	10,447
Other Artisans	65	15,187
Widows and spinsters	19	6,472
Not Specified/Ambiguous	26	12,082
Grand Total	**503**	**284,297**

Categorization by profession according to the author. Broker and Banker category is shown expanded.

Source: NJFD Bankruptcy Commission records, TNA B3/3675.

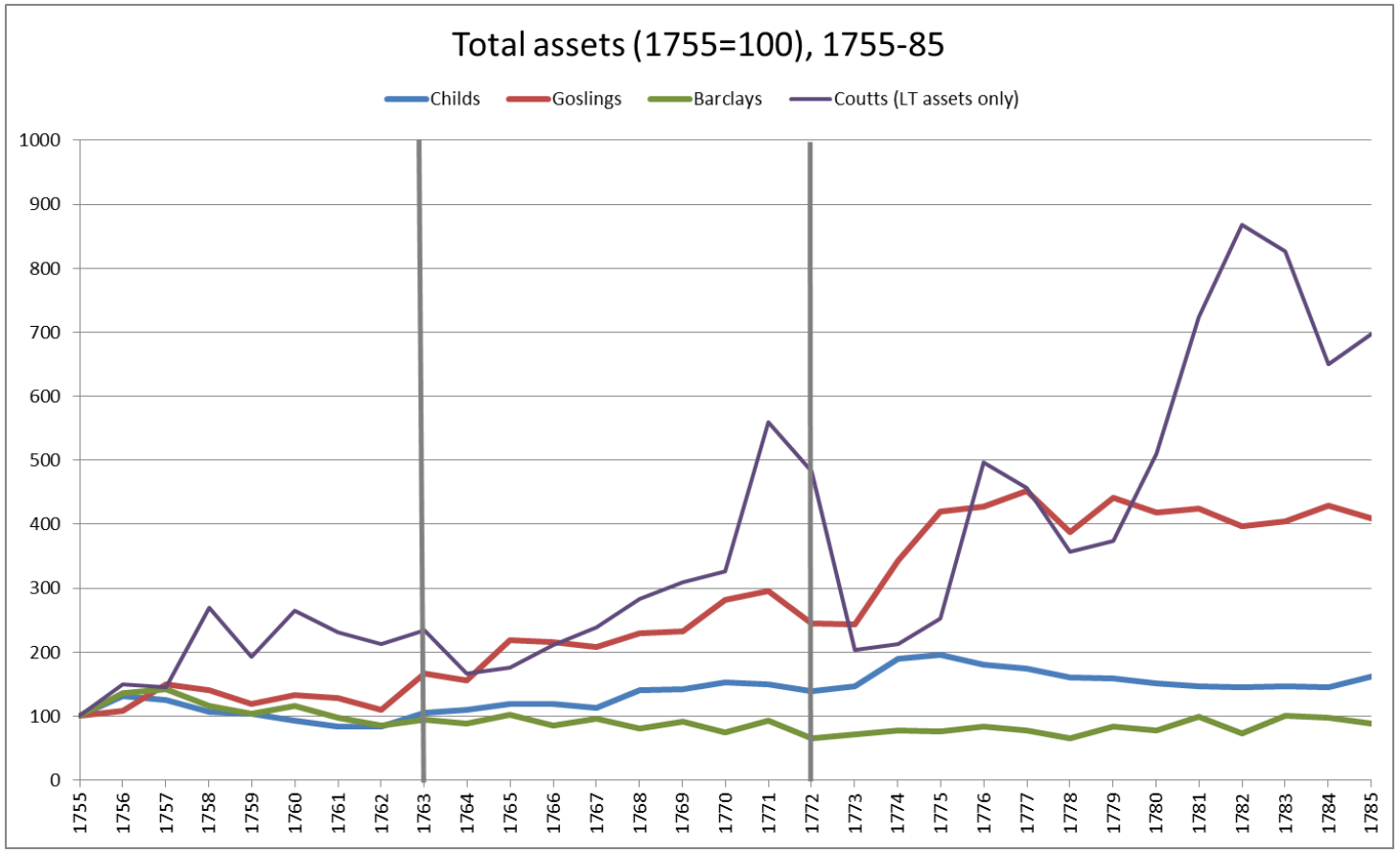

Figure 9. Normalised assets (1755=100) for three English private banks (total assets) and for Coutts Bank (long-term assets only). Sources: BGA 130/729-724, BGA 364/1-40 & 78-84, RBS CH/206/1-3, RBS MCB/1/1-2, RBS PRE/263, COU.

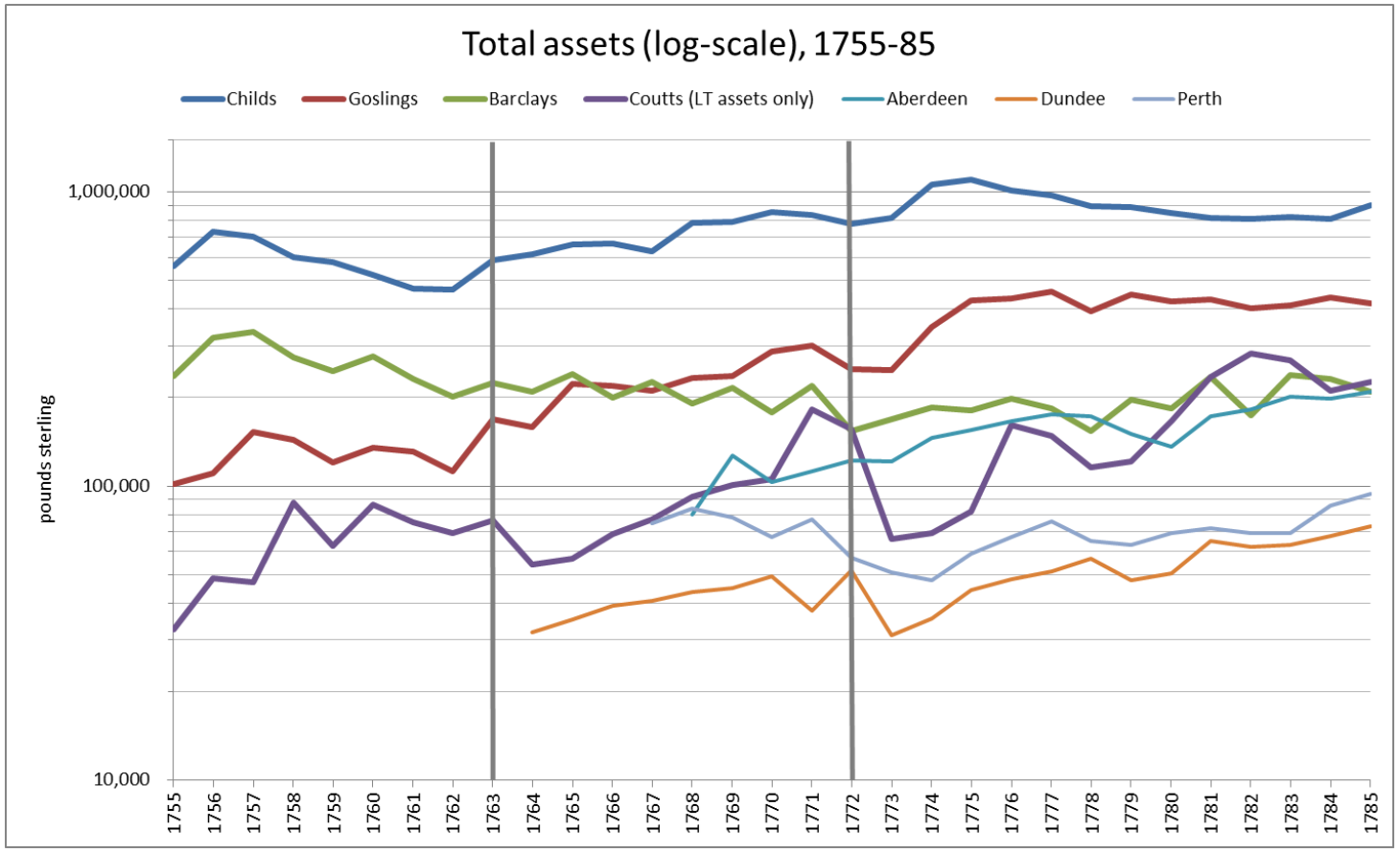

Figure 10. Total assets for three English private banks, Coutts Bank (long-term assets only), and three Scottish provincial co-partnerships. Sources: Childs, Goslings, Barclays, Coutts: as per Figure 3.4. Aberdeen, Perth: Munn, *Provincial banking companies*, pp. 242-3 & 277-9. Dundee: Boase, *Century of banking,* pp. 50-139.

Table 10. Bank balance sheet growth trends, 1762-71 and 1755-62

	"Boom decade" (1762-71)				"Seven Years War" (1755-62)				"Displacement"	
	Total	**CAGR**	AAGR	Std Dev	Total	CAGR	AAGR	Std Dev	**Δ(CAGR)**	1762-3
Childs	79.7%	**6.7%**	7.2%	11.2%	-17%	-2.6%	-2%	15%	**9.3%**	26%
Goslings	168.0%	**11.6%**	13.1%	20.2%	10%	1.4%	3%	19%	**10.2%**	51%
Barclays	9.1%	**1.0%**	2.1%	16.0%	-15%	-2.3%	-1%	20%	**3.3%**	11%
Coutts (LT assets only)	163.2%	**11.4%**	13.9%	26.0%	113%	11.4%	17%	41%	**0.0%**	10%
Aberdeen [(a)]	52.5%	**11.1%**	14.4%	32.3%						
Dundee [(c)]	61.4%	**12.7%**	7.3%	16.5%						
Perth [(d)]	2.7%	**0.9%**	1.4%	14.2%						

[(a)] 1768-1772
[(b)] 1764-1772
[(e)] 1767-1771

Sources: Same as Figure 10.

Table 11. Ayr Bank balance sheet at the time of its stop of payments, 22 June 1772

Liabilities		*Assets*	
Deposits	300,000	Cash & Fixed Capital	2,000 [b]
Banknotes in the circle [a]	224,000	Debts at main branches	694,175
Drafts on London correspondents	600,000	(of which self-dealing	400,000)
Paid-up capital	104,413	Debts at agencies	133,788
"Profit" put in to make up balance	*10,630*	Bills on London	409,079
		(of which dishonoured	180,000)
	1,239,043		1,239,043

Amounts in pounds sterling. Author's estimated figures in italics

[a] 1773 estimates (NAS GD224/178/2/22). The *Precipitation* (written in 1778) rounds this down to £220,000

[b] Checkland, *Scottish Banking*, 237. This figure is unattributed to a primary source, and is almost certainly an underestimate.

Source (unless otherwise noted): *Precipitation*, pp. 86-7.

Table 12. Bank asset leverage factors (total assets/shareholders' equity), 1755-85

	Barclays	Goslings	Curries	Bristol	NJFD	Ayr	Dundee	Aberdeen	Perth	Dreyer
1755	16									2
1756	13									1
1757	12									1
1758	11									1
1759	9									1
1760	10									1
1761	8									2
1762	8									2
1763	9									2
1764	8						25			2
1765	8						28			2
1766	8						11			2
1767	7						8		8	2
1768	6						8	4	7	3
1769	7						7	4	6	3
1770	12						7	3	5	2
1771	12						5	4	5	7
1772	9				9-21[a]	12	7	3	4	failed
1773	8	28[b]		9	failed	failed	5	4	4	
1774	9		4	10			5	4	3	
1775	8		5	11			6	4	4	
1776	7		4	15			7	5	5	
1777	7		5	16			7	5	5	
1778	7		6	14			7	5	5	
1779	11		5	16			6	4	5	
1780	10		8	10			6	4	5	
1781	11			11			8	5	5	
1782	10			12			7	5	5	
1783	11			13			7	5	5	
1784	9			14			6	5	6	
1785	11			12			7	5	6	
Average (1763-72)	9[c]		[5]	[12]		12	7[d]	4[d]	6	3

Sources (left to right): BGA 130/729-724, BGA 364/1-40 & 78-84, RBS CU/118, RBS MCB/1/1-2, same as Table 3.7, RBS CH/206/1-3, same as Table 3.5, Boase, *Century of Banking*, pp. 50-139, Munn, *Provincial banking companies*, pp. 242-3, *ibid.*, pp. 277-9, BGA 392/72.

Table 13. Liability estimates for Neale, James, Fordyce, and Down, 1772

	£	Implied Leverage
Debts proved to Commission, 21/6/1794	181,879	11
Debts proved to Commission, 23/12/1772	146,402	9
Total claims to Commission, 1772	284,297	18
Total claims, inclusive of petitions to Lord Chancellor	411,000	26

Sources: TNA B3/3675 (Commission claims), B1/62 fos 75-6, 101-3, B1/65 fos 136-8, 146-153 (petitions).

Table 14. Bank cash-to-liabilities ratios, 1755-85. Possible crisis responses marked in bold.

	Childs	Barclays	Goslings	Drummonds	Curries	Dimsdale	Prescott	Bristol	Ayr	Aberdeen	Dundee	Perth
1755	35%	50%	34%									
1756	**41%**	**72%**	**47%**									
1757	**68%**	**62%**	**43%**									
1758	30%	45%	30%									
1759	41%	49%	35%									
1760	32%	47%	46%									
1761	35%	50%	40%									
1762	29%	53%	37%									
1763	26%	52%	**43%**									
1764	**29%**	**58%**	31%								11%	
1765	23%	51%	34%								11%	
1766	26%	46%	36%								12%	
1767	27%	48%	30%								24%	11%
1768	25%	23%	24%							36%	11%	12%
1769	28%	22%	30%							42%	11%	12%
1770	32%	17%	35%							33%	6%	6%
1771	29%	26%	29%							13%	8%	27%
1772	**35%**	**46%**	20%						0.16% [(a)]	12%	**43%**	19%
1773	**39%**	32%	**29%**					18%		12%	17%	22%

1774	**44%**	35%	25%					14%	14%	20%	10%
1775	37%	31%	24%					15%	15%	18%	8%
1776	37%	28%	22%					17%	11%	26%	6%
1777	31%	29%	17%	39%	14%	14%		18%	6%	28%	9%
1778	**45%**	**35%**	27%	**66%**	**31%**	**30%**		**20%**	6%	25%	**15%**
1779	**53%**	**41%**	**45%**	64%	22%	23%		16%	**11%**	**32%**	10%
1780	40%	23%	30%	52%	19%	26%	31%	15%	4%	33%	9%
1781	41%	34%	37%	42%		19%	25%	12%	3%	22%	13%
1782	51%	31%	28%	45%		19%	31%	23%	3%	23%	12%
1783	38%	32%	16%	29%		12%	25%	13%	2%	21%	10%
1784	33%	41%	27%	23%		20%	26%	14%	3%	23%	15%
1785	53%	38%	17%	17%		21%	24%	17%	5%	13%	7%
Average (1763-72)	27%	32%	38%						31%	12%	13%

Sources: Same as Table 12, with the addition of RBS DR/37 (column 4), RBS DIM/78 (column 6), RBS PRE/263 (column 7).

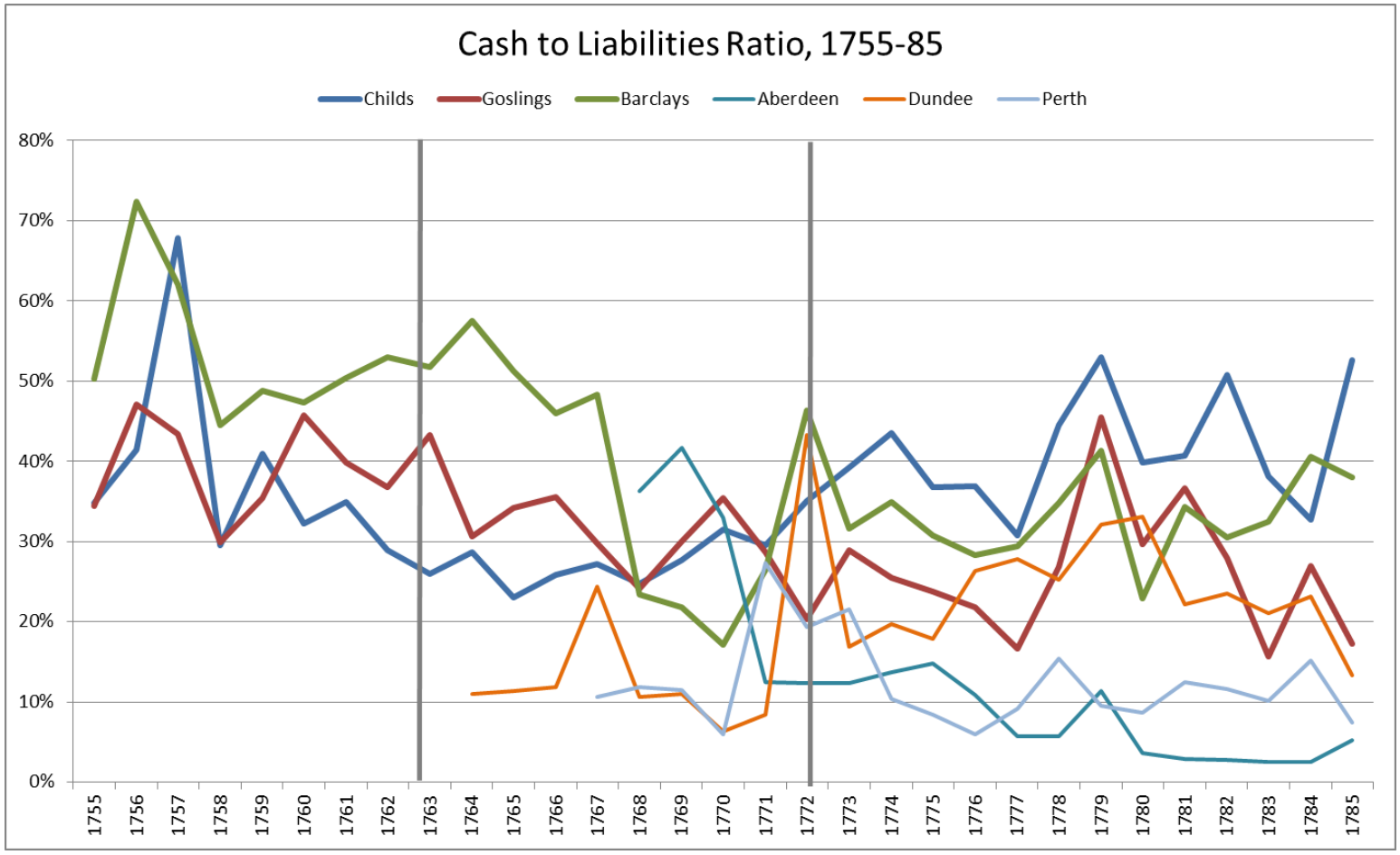

Figure 11. Cash-to-liabilities ratio for six British private banks. Sources: as per Figure Table 14.

Table 15. Size estimates of the British private banking system in the 1760s and 1770s

		Number of banks	
Average partners' equity, London private banks	15,000 - 20,000	50	
Average partners' equity, English country banks	10,000	100	
Total private bank equity commitment, England	1,750,000 - 2,000,000		
Total private bank equity commitment, Scotland	500,000		
Average asset leverage, England	7-9		
Average asset leverage, Scotland	6		
Total private banking assets, England	12,250,000 - 18,000,000		
Total private banking assets, Scotland	3,000,000		
Total private banking assets, Britain	15,250,000 - 21,000,000		
Non-cash asset fraction, England	2/3		
Non-cash asset fraction, Scotland	9/10		
Non-cash private banking assets, England	8,200,000 - 12,000,000		
Non-cash private banking assets, Scotland	2,700,000		
Non-cash private banking assets, Britain	11,000,000 - 15,000,000		
		% of Scottish system	% of British system
Ayr Bank, total assets	1,250,000	45%	8-11%
Ayr Bank, long-term assets	825,000	30%	6-8%

All amounts in pounds sterling. All figures and results of calculations approximate. Figures do not necessarily follow from direct addition/multiplication with each other.

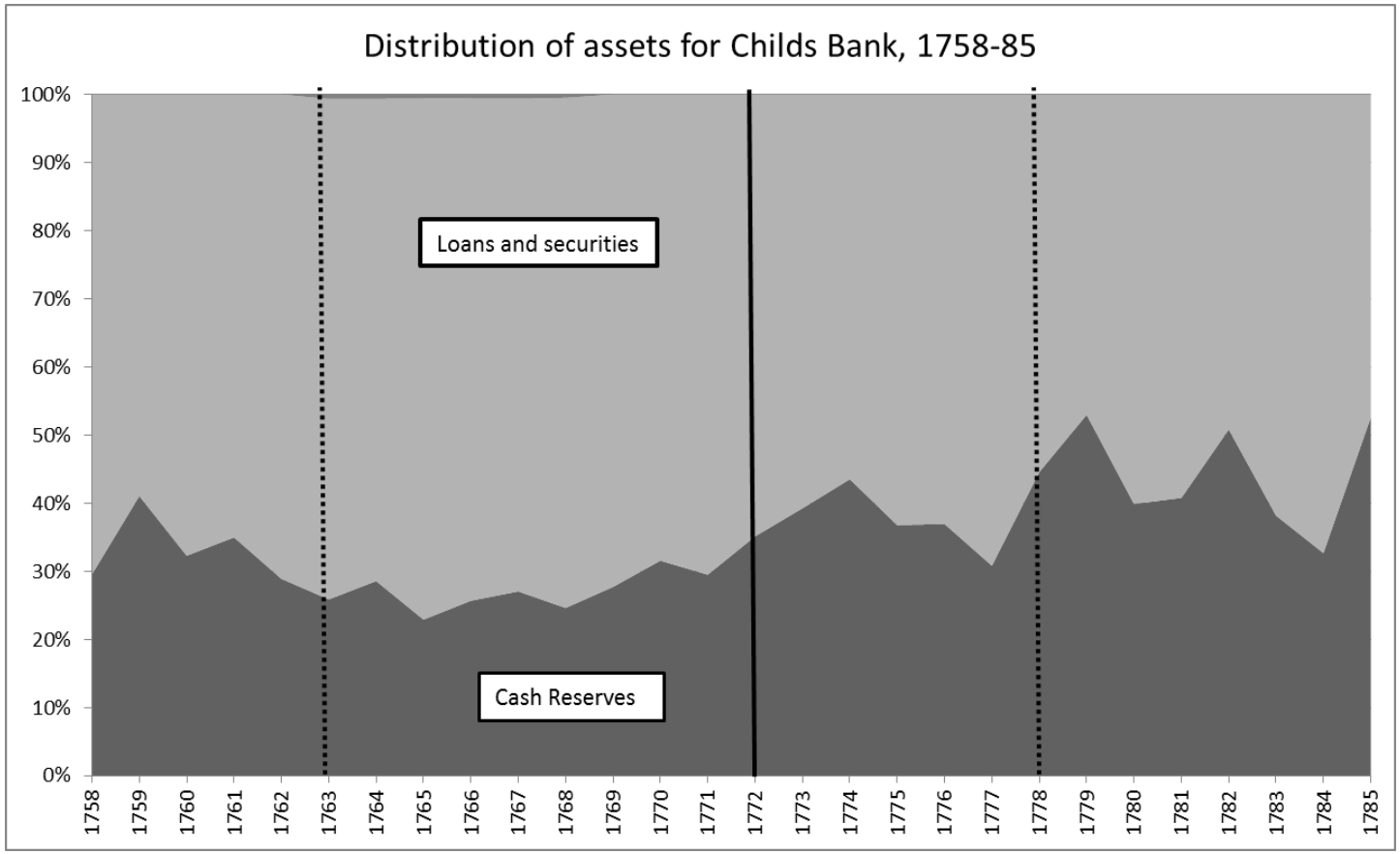

Figure 12. Annual distribution of assets for Childs Bank, London. A small miscellaneous subdivision of "Sundries" at around 2.5% of total assets between 1763-68 is unlabelled at the top the graph. The vertical lines mark potential displacement or crisis events: (a) Breakout or end of European war (dotted); (b) 1772-3 credit crisis (solid). Source: see Table 14.

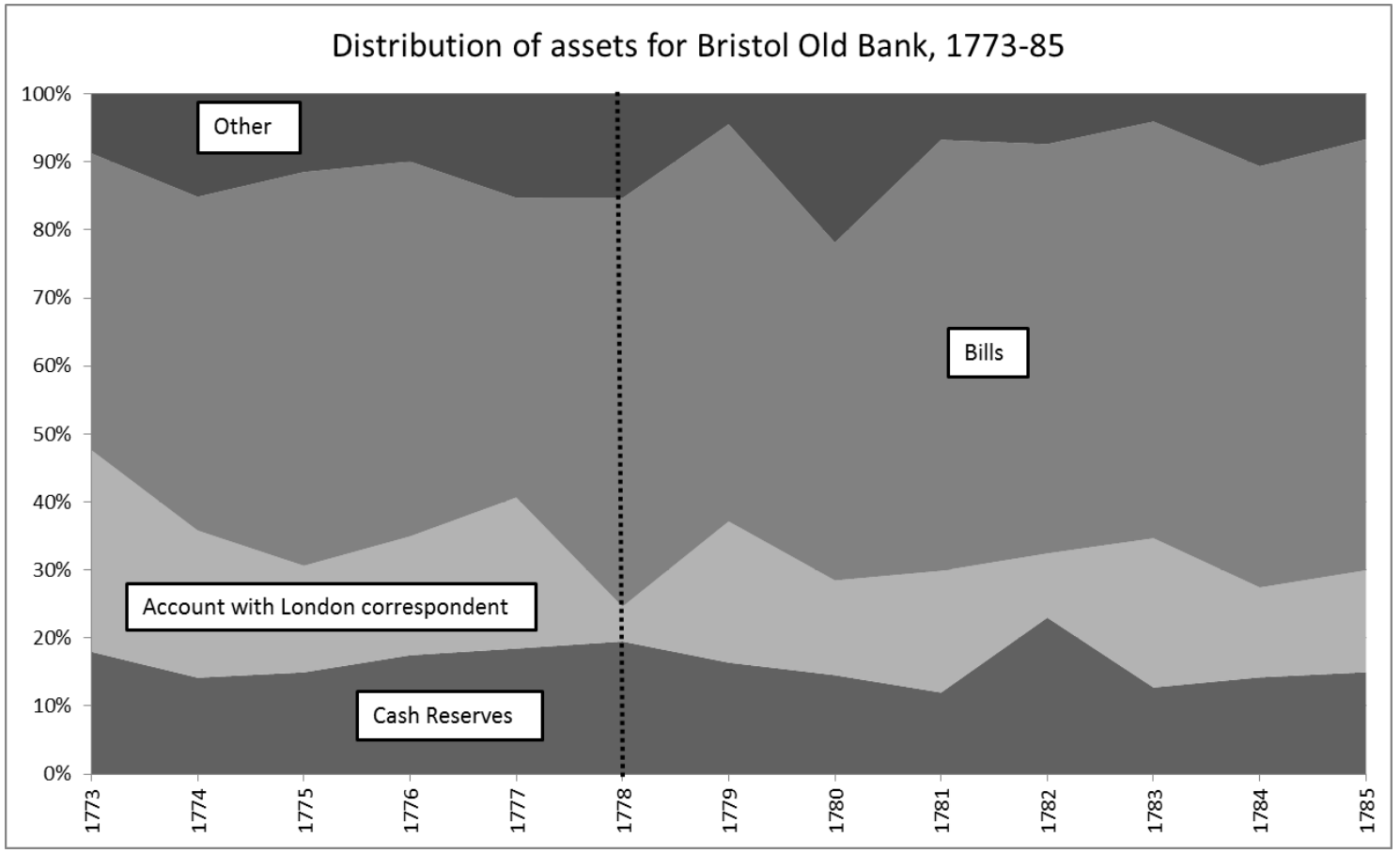

Figure 13. Annual distribution of assets for Bristol Old Bank. The vertical lines mark potential displacement or crisis events: Breakout or end of European war (dotted). see Table 14.

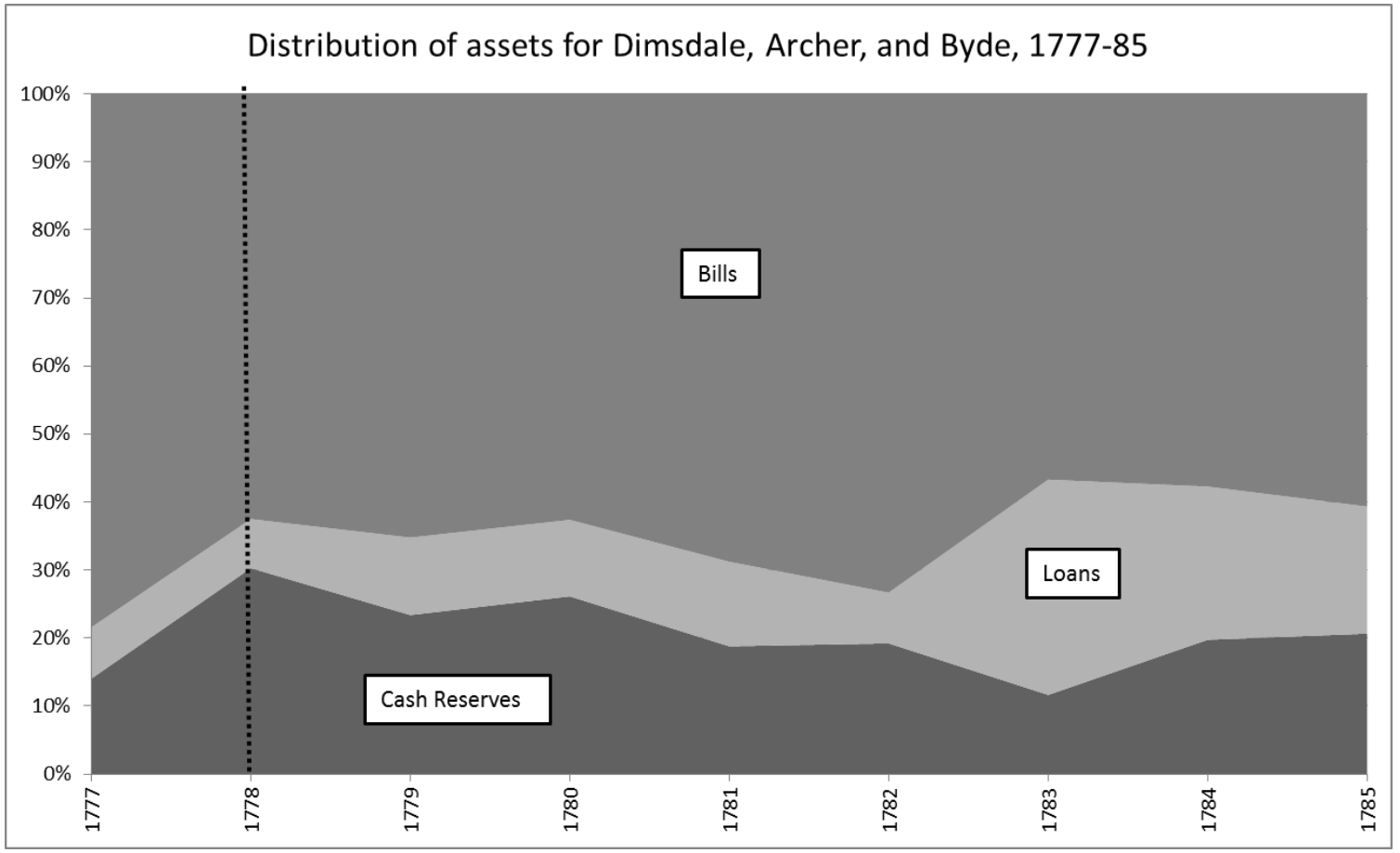

Figure 14. Annual distribution of assets for Dimsdale, Archer, and Byde, London. The vertical lines mark potential displacement or crisis events: Breakout or end of European war (dotted). see Table 14.

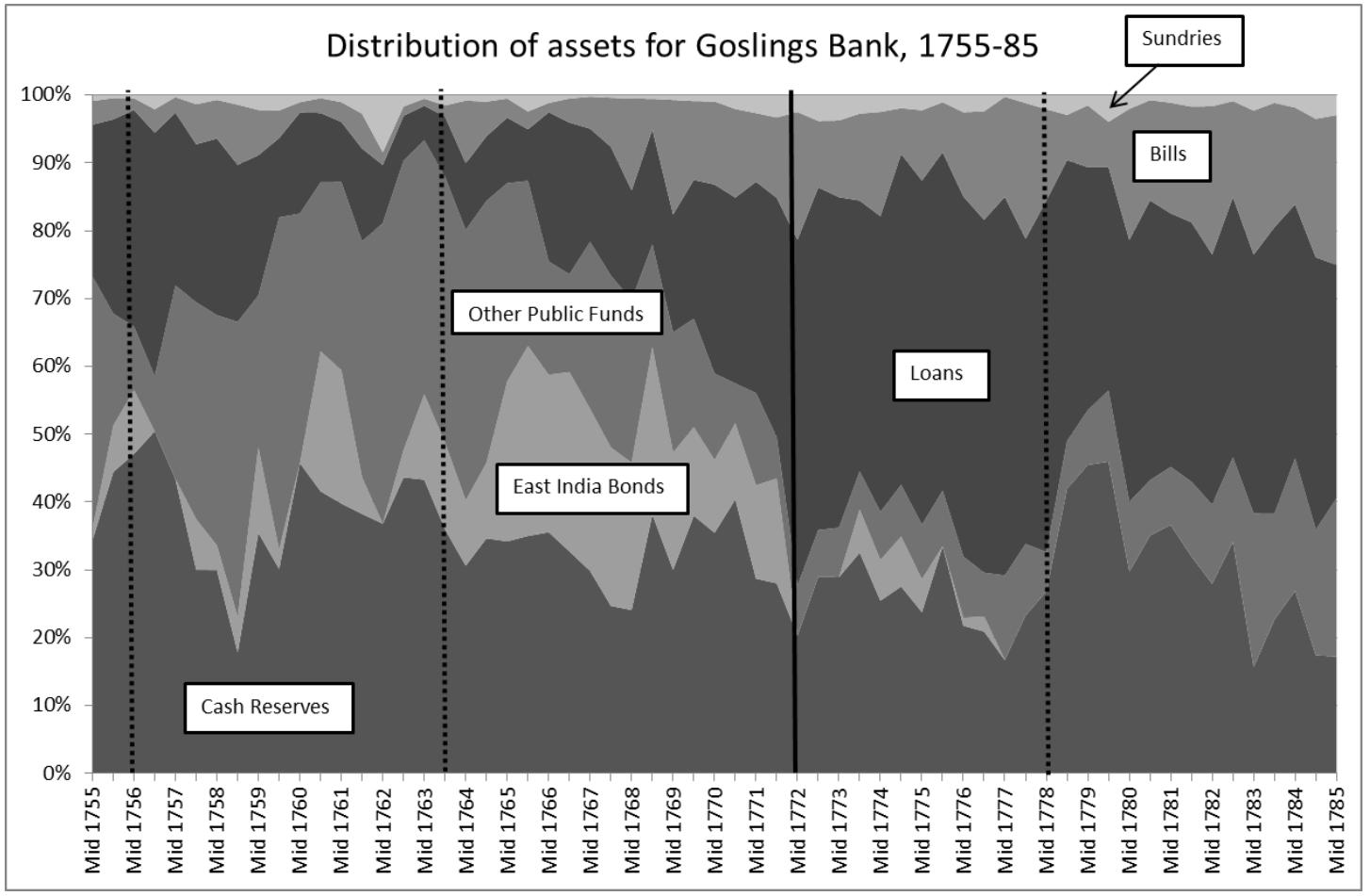

Figure 15. Annual distribution of assets for Goslings Bank, London (semi-annual data points). The vertical lines mark potential displacement or crisis events: (a) Breakout or end of European war (dotted); (b) 1772-3 credit crisis (solid). see Table 14.

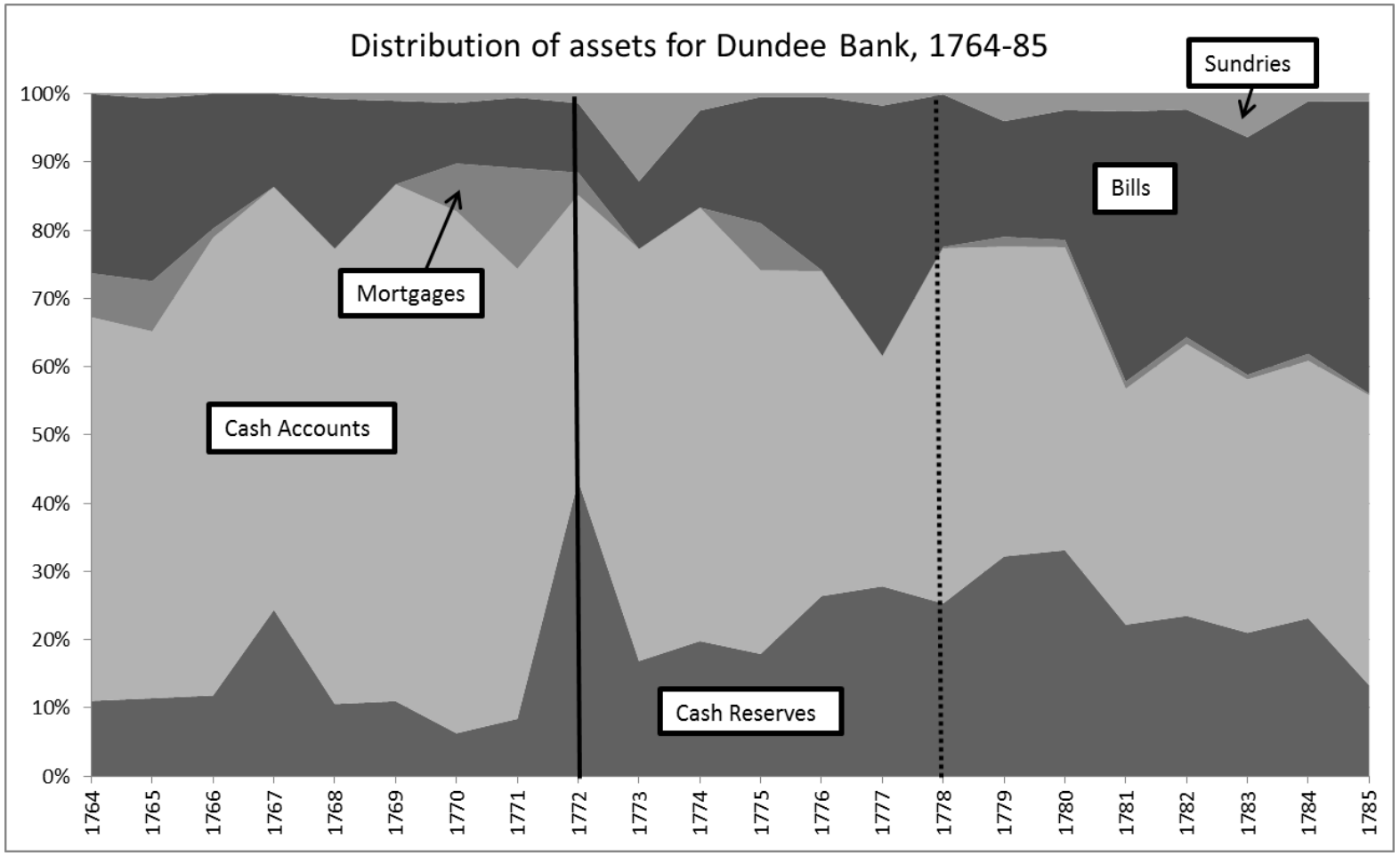

Figure 16. Annual distribution of assets for Dundee Bank. The vertical lines mark potential displacement or crisis events: (a) Breakout or end of European war (dotted); (b) 1772-3 credit crisis (solid). Source: see Table 14.

The payment system: bills of exchange and paper money

The asset side of any balance sheet inevitably tells only half the story. Even the strongest group of assets can be undone if arrangements for funding them are constructed imprudently or fall apart after an external shock. We have already briefly looked at the liability side as a whole when discussing shareholders' equity and cash-to-liability ratios. It is however two groups of liabilities which have been identified above all others as embodying the weaknesses and excesses of the payment system of the 1760s: bills of exchange, and paper money issuance.

We have already referred to bills of exchange in passim, and in the end of the previous section described how they formed a substantial proportion of some banks' assets. It is now time to introduce them more formally and expand on their role as liabilities. Like so many other financial instruments and concepts, bills of exchange were a late medieval Italian development that had grown increasingly common in British finance after the Financial Revolution of the turn of the eighteenth century. By the 1760s they were so well established that manuals like the *Universal Accountant* dedicated a major part to them. Its definition remains as concise and accurate as any other:

> A Bill of exchange is, a short order for money to be received in one place or country, for the value paid in another; in which there are generally four persons concerned; two at the place where it is drawn, and two at the place of payment; *viz*. the *drawer*, or he who gives the order to make payment; the *indorser*, or he to whose order the bill is made payable, and remits it to his correspondent, with an indorsation or transference of property; the *porteur* or remitee, to whom the bill is remitted for acceptance and payment; and the *accepter*, upon whom the order is made, and by his

> acceptance binds himself to the payment of the debt, or observance of the order.[115]

For the modern reader who is unfamiliar with the instrument, the closest equivalent to a bill of exchange is a post-dated cheque.[116] The "drawer" is the same in both cases, being the person who gives the order of payment. The same holds for the "payee" or "indorser", being the person named as the recipient of the funds. The differences are that, whereas a modern cheque is drawn on a bank in which the drawer keeps an account, and the bank's liability runs only to the extent that this account has sufficient funds in it to clear the cheque, a bill of exchange was "accepted" by a physical person. That person could be a banker, but this was not necessary. Another major difference was that from the moment someone accepted the bill he became fully liable for its full principal amount. Furthermore, if before maturity the original payee had "endorsed" the cheque to a further recipient for payment of his own debts, then *the endorser too became fully liable for the principal* as much as the drawer and acceptor.

Bills had three primary functions. The original one had been to effect payments related to trade transactions featuring a time lag between agreement and delivery, or where the counterparties were separated by long distances. Very often bills incorporated a foreign exchange transaction as well. By 1772 the bill drawn on London or Amsterdam bankers (and, increasingly, on aggressive Scottish newcomers like the Ayr Bank) was the long-established cornerstone of international trade, allowing the fast and safe transfer of funds without the risk and expense of transporting specie, even had specie been abundantly available.[117] "Inland" bills in the same currency had also become increasingly common since the Seventeenth

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[115] Gordon, *The Universal Accountant*, p. 351.

[116] But *not* a "crossed", or "account payee only" cheque. Bills of exchange were endorseable like modern "uncrossed" cheques.

[117] Ashton, *Economic history*, p. 186

Century, and were a direct pointer to the growing monetization and financialization of British commerce.[118] Safety and convenience aside, one of their greatest advantages was flexibility. In practice, the four contracting parties were often reduced to three or even just two (the drawer and acceptor being always necessary), as it was not unknown for a drawer to make a bill payable to himself thus turning it in some measure into a bearer instrument. As already intimated above, bills were also transferable through serial endorsement: the beneficiary ("indorser" according to the definition above, sometimes also known as the "payee") could himself endorse a bill to a new beneficiary before it matured - and he in turn to another.

All this made bills more fungible, a quality that was recognised in practice by those London banks like Dimsdale or Prescott who discounted large quantities of them daily. This in turn gave rise to their second major function, that of constructing money market loans in the absence of a modern style interbank market.[119] According to so-called "acceptance" loan transactions, borrowers paid commissions to their local bankers for them to draw "accommodation" bills accepted by the latter's London (or Amsterdam) correspondents, in effect renting the established credit of internationally connected banks. The bills thus drawn were subsequently sold on at a discount to other investors who at maturity would present them to the international banker for repayment of their par value (Figure 17).[120] Alternatively, they could be rediscounted at a bank, with the BOE being the ultimate discounting power in the country through sheer size of capital resources.

The third function of bills was to act as a surrogate paper currency. The formal monetary system of the country was founded on a *de jure* silver standard, with the pound sterling as the universal unit of account. In practice however, the

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[118] Kerridge, *Trade and banking in early modern England*, pp. 45-84.
[119] Neal, Rise of Financial Capitalism, pp. 5-9.
[120] Rogers, *Law of bills and notes,* pp. 225-6, Schnabel and Shin, 'Liquidity and contagion', pp. 935-7.

gold guinea was far more prevalent as the practical medium of exchange, though the establishment of a formal gold standard would have to wait for another half century. More important than this bimetallism however, was the widespread contemporary conviction that there was never enough specie of either sort to serve the needs of an expanding economy. This deficiency became particularly acute when it came to small denomination coins which were virtually non-existent.[121] In addition, there was a steady specie drain all through this period, running North to South from Scotland to London and thence to Amsterdam. This was partly due to the wartime commitments of the British government, who had to pay for its foreign subsidies and troops in specie, but also by the fluctuations in the supply and demand of metallic money in the main commercial centres of the continent. The official data (which are almost certainly an underestimate of the true level of this trade, since specie was easily and widely smuggled) show that an average of £1.2 million a year was exported during the Seven Years War (Figure 18). Even during the peaceful interval that followed, the drain continued at an average of over £700,000 per year. Modern estimates for the coin stock of England range from £15-18 million in 1750 to £20-44 million around the turn of the nineteenth century. Around the time of the crisis the specie in circulation may have been around £16-27 million.[122]

To compensate for these deficiencies, a number of monetary substitutes were pressed into use, including foreign coins, counterfeit coins, and privately issued

[121] For other monetary surrogates used at the time, see Mathias, *Transformation of England*, pp. 190-208.

[122] Cameron, *Banking in the early stages of industrialization,* p. 42, is the source of the lower figures for 1750 and 1800, Capie, 'Money and economic development in England', p. 223-4, for the higher ones for 1750 and 1790. For the 1770s, the lower figure is again by Cameron as above, the higher an estimate by Palma, 'Annual money supply over the long-run'. Palma's full time series is available online in *A millennium of macroeconomic data for the UK*: *The Bank of England's collection of historical macroeconomic and financial statistics*, Version 3 - finalised 30 April 2017, http://www.bankofengland.co.uk/research/Pages/datasets/default.aspx#threecenturies. His calculated figure for 1772 is £26.7 million.

token money, as well as a wide variety of payments in kind.[123] Above all, there was a constant seeking after paper monetary surrogates. Banknotes were the obvious substitute, but even with the growth of note-issuing country banks the amounts issued were still a minority of the total money supply of the country. Notwithstanding ubiquitous contemporary English complaints about the "Deluge of Scotch Paper Currency",[124] the BOE's own note issue remained the largest component of paper money outstanding and remained broadly constant throughout the 1760s around the £5-6 million mark (Figure 19). Perhaps another million comprised the sum of the private bank issues in England,[125] while Scotland's supposed flood of paper amounted to a mere £864,000 with the Ayr Bank contributing £224,000.[126] The Scottish component was perhaps disproportionate for what was still a small and poor country, while its increase of almost a third in the three short years of the Ayr Bank's life was certainly dramatic in relative terms. Set against this however, are the recurring and persistent voices (even *after* the crisis) that Scotland's monetary base had been unacceptably narrow for its growing economy. Above all, it should be remembered that none of these Scottish paper issues circulated south of the Tweed, much less in London where all the press complaints about them originated.

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[123] Cameron, *Banking in the Early Stages of Industrialization*, p. 19.

[124] One of the most famous contemporary cultural references about this crisis (used for instance in Price, 'The Bank of England's Discount Activity') is the anonymous satirical print *A View of the Deluge of Scotch Paper Currency for English Gold* (1 August 1772, 118mm x 174mm, Etching, BM Satires 4961): A kilted Scotsman on a flying broom is depicted carrying away money-bags while scattering banknotes in his wake and chuckling "The deel away wi ye all ye English Pudding-bags ken ye nae that Paper is lighter of digestion than Gold". In the background, three other Scots of evidently Jacobite leanings are seen rowing away more gold "Well over the Water to [Bonnie Prince] Charly". A seated Britannia exclaims that "This Scotch paper diet has brought me to a consumption". Two unidentified ruined men exclaim "Oh I am sunk for ever and "Let me hide my face. How can I now show my self to my creditors" respectively. On the right foreground the Prime Minister remarks that "I will not at present promise to pay 17 Million in ten Years", referring to his "Scheme of paying off the National Debt".

[125] Cameron and Capie, as above.

[126] Checkland, *Scottish Banking*, p. 237.

No banknotes, whatever their origin, circulated widely enough in any event; even BOE notes became increasingly scarce only a few tens of miles outside London. Country bank notes were even less prevalent, and also suffered from lack of universal acceptability. On the other hand, bills of exchange accepted by a reputable bank in a major financial centre like London or Amsterdam were in some ways as good, or better, quality money as many country bank notes. The main problem with using bills in a monetary capacity, however, was that unlike specie or conventional banknotes bills had a built-in maturity date, and a short one at that: "long-dated" bills were usually drawn for three months after date at most. This obstacle was circumvented through the notorious practice of "swivelling", or the drawing of new bills as "payment" for maturing ones. According to Smith's oft-quoted description:

> The trader A in Edinburgh… draws a bill upon B in London, payable two months after date. In reality B in London owes nothing to A in Edinburgh; but he agrees to accept of A's bill, upon condition that before the term of payment he shall redraw upon A in Edinburgh, for the same sum, together with the interest and a commission, another bill, payable likewise two months after date. B accordingly, before the expiration of the first two months, redraws this bill upon A in Edinburgh; who again, before the expiration of the second two months, draws a second bill upon B in London, payable likewise two months after date; and before the expiration of the third two months, B in London redraws upon A in Edinburgh another bill, payable also two months after date... This practice [had] sometimes gone on, not only for several months, but for several years together, the bill always returning upon *A* in Edinburgh, with the

> accumulated interest and commission of all the former bills… This practice was called raising money by circulation.[127]

This artificial extension of the bills' maturity finally gave them all the characteristics of a surrogate paper currency money. It is not obvious, however, whether the chief motivation behind swivelling was the desire to supplement a meagre monetary base with additional inside money, or a wish to extend short-term accommodation loans so as to finance asset growth. The accumulation of bills on London as assets served both purposes, especially in Scotland.[128] Scottish banks were well advanced in the practice of issuing conventional banknotes, which were by construction perpetual, fungible, and payable to bearer, and hence superior as liabilities compared to drawing bills. On the other hand, banknotes were theoretically convertible on demand, unlike bills with their fixed maturities. Considering the narrow metallic monetary base of the country this made note issues precarious, as any sudden and vigorous demand for specie against them could not be practically backed by the limited quantities of metallic money in circulation. The danger of sudden presentation of a large amount of their banknotes was an ever present threat for Scottish banks. The establishment of a note exchange system, through which banks netted out each other's notes as they came into their possession, somewhat diminished this danger and helped bring an end to the frequent "note wars" that had raged between them in the past.[129] Furthermore, an "Optional Clause" had been introduced in the early 1760s, by which banks could elect to defer payment of specie on presentation of their notes in exchange for paying 5% interest for six months. The Optional Clause was highly controversial, however, and was finally banned in 1765

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[127] *Wealth of Nations*, II.ii.68.
[128] *Precipitation*, pp. 61-5.
[129] Munn, *Provincial Banking Companies,* pp. 12-4 (note wars), pp. 21-8 (note exchange), Checkland, *Scottish Banking*, pp. 59-62, 115-8 (note wars), p. 126-8 (note exchange).

by Parliament. [130] By the time of the establishment of the Ayr Bank four years later, the problem of insufficient reserve money to maintain the various banknote issues remained as acute as ever. Bills on London could partly fill that gap**,** and the resulting high demand for them made them very expensive. The "adverse exchange" with London was an ongoing problem in Scotland throughout this period,[131] and may well have added to the urgency through which Ayr Bank issued ever more of its banknotes in an attempt to buy up more of these liquid and widely accepted instruments. The same was even more the case in the American colonies, where the structural deficits of the tobacco trade, together with the fact that American paper money issues in all their great variety and (all too often) inflationary disrepute were not readily accepted by British merchants, drove the exchange for London bills there as high as 25-33% in premium.[132] The situation deteriorated after the BOE reportedly became reluctant to discount Scottish bills. According to the *Inquiry*,[133] this latter restriction had been directly behind the growth of correspondent banking with London, as the Bank was more amenable to discounting paper accepted by London bankers rather than Scottish merchants.

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[130] 5 Geo. III, c. 49. The optional clause had been introduced by the Bank of Scotland in 1730 as a self-defence mechanism in the event of an attack through sudden presentation of its banknotes. By the 1750s and 1760s it had evolved as a method to support note issues in the prevailing dearth of specie. See Checkland, *Scottish Banking,* pp. 67, 109-10, 118-22. The optional clause is a major item of interest in the Free Banking debate. In addition to the references Chapter 4 where the Free Banking literature is more fully referenced, see also Dowd, 'Option clauses and bank suspension', Gherity, 'The Option Clause in Scottish Banking', Shah, 'The option clause in Free Banking theory and history'. Goodspeed, *Legislating Instability*, pp. 31-46, has convincingly argued that the motivation for this move was less the supposed inflationary risk that the Optional Clause posed to the financial system, and more the result of political lobbying by the Edinburgh Public banks trying to maintain their dominant position in Scotland. In fact the clause was rarely invoked, and then only in self-defence during "note wars", that is the accumulation and sudden presentation of banknotes for specie by agents hostile to the issuing bank.

[131] Checkland, *Scottish Banking*, pp. 108-11, 121-4.

[132] Weiss, "The issue of paper money in the American colonies', West 'Money in the Colonial American economy', Hanson, 'Money in the Colonial American economy', Smith, 'American colonial monetary regimes'.

[133] *Inquiry into the late mercantile distresses*, p. 19.

The potential dangers inherent in swivelling and the unchecked use of accommodation bills were manifold. One was that costs could become heavy for habitual users. Bankers in major financial centres were happy to oblige requests for swivelling since commission income could be lucrative. Smith's back-of-the-envelope calculation for the Ayr Bank was for six such operations annually at an average commission of 0.5% each, leading to an aggregate cost of 3%. Estimates by the Ayr Bank's liquidators later put this overhead as high as 7% per annum on top of the 5% legal interest at the peak of the credit crisis in early 1773, after the bank had already temporarily stopped payment.[134] On top of the usual maximum of 5% interest mandated by the usury laws, this implied that the bank was paying as much as eight to twelve per cent per annum for its money-market loans.[135]

More seriously, such practices could dramatically expand balance sheets at a stroke of the pen. This was already the case when merely extending the bills' maturity as described above, but often the bills exactly mirrored each other in both terms and amounts, with one counterparty accepting the other (or its confederates). This served to provide the counterparties with additional liquid (and potentially, discountable for hard cash) instruments. A typical swivelling arrangement involving several failed firms of June 1772 can be seen in Table 16.[136] John Fordyce's Edinburgh-based Fordyce, Malcolm & Co. and Arbuthnot & Guthrie, an Edinburgh private bank with notable connections to the British Linen Company, drew for the benefit of each other bills with exactly matching payable amounts and maturity dates. The accepting banks in London were either Fordyce's London partnership, Fordyce, Grant, & Co., or Charles Ferguson & Co., another London-based Scottish

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[134] Letters by George Home to Henry Dundas, NAS GD224/178/2/22 (15 January 1773) and GD224/178/2 (15 March 1773).

[135] Smith *Wealth of Nations*, II.ii.73.

[136] Further swivelling evidence implicating Arbuthnot & Guthrie, the Ayr Bank, Fordyce & Malcolm and Fordyce & Grant, Bogle & Scott, Andrew Sinclair & Co., and William Alexander & Sons can be found in RBS EQ/23/35-6, RB/12/12, fo. 277.

firm which failed at the outset of the crisis. Leaving aside for the moment the credit risk implications,[137] the absence of formal limits on the total amount of outstanding bills in the financial system potentially made this an inflationary practice. This was recognised at the time, particularly when it came to "fictitious bills, i.e. fiat financial instruments that did not correspond to real underlying commercial transactions. Although this was not an innovation particular to this period but long established practice, contemporary crisis sources were quick to assert that the practice had exceeded previous experience by 1772, especially when Scottish firms were concerned. The Real Bills Doctrine, that is the prescription to any bank (with the BOE above all others) to only discount bills that corresponded to real transactions, was later proposed exactly as an internal market mechanism to prevent the expansion of balance sheets beyond the levels prescribed by real commercial activity. The bills employed in the colonial and other import-export trades in which Scotland was so prominent were very much "real", however, and were generated by a voluminous trade in real commodities. Indeed, the very fact that expanding foreign trade created so many *real* bills which could be also used as a monetary instrument may have even fed the financial boom, by providing increased quantities of the very instrument that was its signature.

Above all, bills finance could result in a vicious circle of banknote and bills issuance for those Scottish banks using the London bills market as inside money to refinance their assets and back their outstanding banknote issues. This led them to issue even more banknotes to buy up any available London bills, or to draw their own bills of exchange as payment for them in swivelling transactions. In turn, both banknotes and newly drawn bills required liquid assets to back *them*, leading back to the need to buy up even more London bills (Figure 20). The Ayr Bank became the

[137] Much more will be said on this in Chapter 4, including the total exposures that the Craven-Dreyers-Clifford nexus may have incurred.

most notorious exponent of the practice, resulting in its accumulating in just two and a half years a full third of its assets and almost half of its liabilities in London bills of exchange (Table 17).

All these risks could prove catastrophic for individual firms that overindulged in the practice, especially if the London money markets were ever to shut off, denying them the ability to refinance their balance sheets. As we shall see in Chapter 4, this is exactly the mechanism which drove the Ayr Bank to suspend payments in June 1772. But was such overuse (or abuse) of bills of exchange so prevalent as to endanger the financial system more generally, as contemporaries alleged? More specifically:

1. Was the bills of exchange market a big part of the monetary system as a whole?
2. Is there any concrete evidence that this market grew excessively in the 1760s?
3. Could the positive feedback loop described above truly go on unchecked?

The overall amount of bills of exchange that functioned as monetary instruments has been estimated only in the vaguest terms, and remains the object of widely differing views. Cameron has echoed the crisis' own contemporaries in asserting that bills made up the bulk of the money supply, i.e. potentially up to £20-25 million according to his rough estimates of the latter. Forrest Capie has strongly rejected this, estimating at most '£7 million of inside money' circulating in the middle of the Eighteenth Century, and concludes that as some of this was 'undoubtedly bank deposits… only a small fraction of the total money stock [was] made up of bills'. Capie's estimates, though plausible, are backed up only by a single contemporary reference, that of David Hume who 'spoke of a money stock of £30 million in 1750'.[138] As Capie's calculations of the money base (specie plus banknotes) on that

[138] Refer back to Footnote 102.

date come to only £23 million, this results in the figure for inside money just quoted. The latest estimates by Nuno Palma accept Capie's methodology for bills of exchange; together with his figures for coin in circulation and the ones for paper money given earlier, he has arrived to a broad money (M2) estimate for England of £42.5 million in 1772, and a composite broad money one (M3/M4) of £46.5 million.[139]

The BOE's discount facility can help resolve this debate, as well as answer the three questions posed above. Notwithstanding Smith's claims that swivelling could have continued for years on end, and the undoubted fact that there was no legal bar to limit the amount of bills that could be drawn and accepted in the money markets, the underlying availability of cash ultimately served to put a limit to both practices. Smith focused on real bills as they involved (metallic) cash flows generated by real trade, and even went to the extent of putting BOE notes on an equal footing with those of private banks. In truth, however, the BOE stood on a wholly different plane through the sheer amount of resources available to it. Its discount facility was the biggest source of cash (both metallic and paper) for the money markets, and so long as this remained under control any excessive issuance of bills, real or fictitious, would be starved through lack of access to this ultimate source of hard money. Thus, the fluctuations in the Bank's discount volumes can serve as a proxy of the quantity of inside money available to swivelling counterparties. End-of-year levels for the total amount of bills under discount can be directly obtained from the Bank's balance sheets (Figure 21). Starting from very low levels up to 1760, this amount rapidly increased to a level around £2-3 million which it then maintained throughout the following decade. This is a level much closer to Capie's estimates, but we cannot go into much more detail than this. Though complete, the daily discount returns only list aggregate totals that include interest, and though we know the discount rate the

[139] As Footnote 122 above.

Bank used (5% per annum for inland bills, 4.5% per annum for foreign bills),[140] we know neither the distribution of maturities of the paper it accepted, nor what proportion of the total bills circulating in London this represented. One might assume that the Bank preferred to discount paper with as few days left in it as possible as to minimise its credit exposure to its signatories (usually the bill acceptor, since this was often a London private bank). On the other hand, the desire to earn discount interest must have limited this risk aversion. A hint at the level where these tendencies cleared each other can be gleaned from a private letter by the Ayr Bank's liquidator, George Home, who during the 1773 Amsterdam phase of the crisis mentioned that the Bank 'threw out an acceptance of Sir George Colebrooke which had only 30 days to run' as something entirely out of the ordinary.[141] A residual would in any case be thrown out always, whether out of poor creditworthiness of the signatories or according to the Bank's (also unknown) cash flow budgeting. The converse held for users of the discount facility: normally they would prefer to discount their bills as early as possible so as to minimise their credit exposure to the bill acceptor; on the other hand, too early a presentation would involve a higher cost as the discount interest would run for a longer period. There would also be a residual amount of paper never presented to the Bank but left to mature on its own. These preference functions would clear at some unknown level, perhaps the two months repeatedly mentioned by Smith in his famous description of swivelling. Detailed information from earlier in the century seems to confirm this tendency for discounted paper to range between 40 and 70 calendar days (Figure 22).[142]

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[140] BOE 13A298/1, 'Volume Of Notes And Statistics Found Amongst Papers Relating To Frank May', fo 49. The policy had last changed on 1 May 1746 and would change again in 13 May 1773

[141] NAS GD267/3/3/1, fo 1, George Home to Patrick Home, 11 January 1773.

[142] Detailed bills information is missing (or were never kept) for the period 1709-1847 (see Chapter 4, Appendix). There also survives an annual report between 1808 to 1840 (BOE C36/1, Analyses produced for the Committee on Discounts) which provides interesting consolidated demographics for discounters broken down by profession, though not any maturity information for their bills. Figure 22 was constructed using the latest available 18th century dedicated bills ledgers. It is

The Ayr Bank occupied an especially prominent position in this comparatively small world, with its asset and liability interests together involving perhaps one-fifth of the discountable bills market at the time of its stoppage (Table 17). This made the bank's individual position precarious, but it is unlikely its experience was repeated elsewhere. Rather than hint at a bills of exchange boom, the evidence from the BOE's discounts rather displays a stable picture throughout the period, with the exception of a number of temporary spikes in its activity that coincided with periods of political or financial distress. We will return to the latter in Chapter 4.

Did finance "fan the flames"?

There is little doubt that the growth of financial intermediation was substantial in this period, broadly keeping pace with the steady though unspectacular growth of the overall economy. Whether this growth was strong enough to cause an endogenous asset, credit, or inflationary bubble, or to merely "fan the flames" of an initial economic displacement, is far less certain. Though the surviving data is extremely sparse, it appears that equity growth was mainly fuelled by retained earnings which is not in itself a mechanism conducive to bubble growth. Credit growth also followed broad economic growth trends, and was if anything reversed in Scotland after 1768 by the conscious decision of the chartered banks to retrench their lending activity. .[143] The establishment of the Ayr Bank was intended to provide a release in the pent-up demand for credit caused by this policy, and even its rapid credit growth in 1770 and 1771 may have represented at most a 10% increment of

possible (though in the author's opinion, unlikely) that the Bank's discounting preference changed substantially in the half century separating this information and the run-up to the 1772 crisis. It is also possible (but again, highly unlikely), that the bills had been originally drawn for a much longer period but the BOE only discounted them with under 80 days until maturity. In any event, even if the nominal term were longer, the value of the bills as monetary instruments only extended to the degree that they could be discountable by the ultimate source of hard cash in the country, i.e. the BOE.

[143] NAS, Buccleuch papers, GD224/178/9. This document's context makes it likely that it was authored by George Home.

the private banking credit of the United Kingdom, which in turn was only a modest proportion of the available credit mechanisms in the country.

The traditional charge of monetary fallacy is more plausible, but still not sufficient in itself to justify the destabilization of the financial system. The unregulated circulation of paper money from private banks, especially in Scotland, may have been identified almost immediately as the likeliest culprit of the crisis, .[144] but the figures do not support contemporary concerns. The mild inflation which perhaps prevailed between the Seven Years and American wars was wholly in line with what economic growth took place, and in any event could be better attributed to the fluctuations in agricultural production, still the overwhelming majority of overall economic activity.[145] Moreover, the expansion of banknote circulation was in fact not substantial: the BOE's note issue remained broadly stable, and considering that it dwarfed all private bank issues (including the supposedly extravagant Scottish ones) by as much as three to one, it is doubtful that any excess from that quarter would have made much of a difference. Even the Ayr Bank's supposed "deluge of paper currency" that the hostile London press dwelt on so much during the immediate aftermath of the 1772 crisis may have comprised as small a proportion of the overall paper money issue of the country as 2.5%.

When it comes to bills of exchange, contemporary accusations of imprudence and excess seem more convincing in the light of surviving evidence. The total amount of bills outstanding in the system was probably not all that excessive, considering that the BOE discount facility may have accommodated at any time around £2-3 million at most out of perhaps £7 million in inside money. This was but a modest proportion of the total monetary base of the country, which in turn was considered almost universally as totally inadequate for the needs of an expanding

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[144] *Inquiry on the late mercantile distresses*, pp. 6-8.
[145] Ashton, *Fluctuations*, p. 36.

economy. Theoretically of course bills could be swivelled forever, and their outstanding notional amounts could accordingly become astronomical. In practice however, the BOE's discount activity served to put a very real limit on issuance, since the inability to have a bill discounted by the Bank almost instantaneously destroyed its creditworthiness and value as a financial instrument. There were in fact numerous apocryphal reports in 1772 that the crisis had been precipitated by the Bank's sudden refusal to discount Scottish and Dutch Jewish bills, after it became concerned at the supposed monetary bubble.[146] These rumours are entirely unsubstantiated by the minutes of the Bank's Court of Directors, where there is not a single mention of a change in discount attitude throughout the pre-crisis period.[147] On the other hand, the multiple liability regime inherent in bills of exchange, by which every drawer, acceptor, and endorser could be held liable for its whole principal, meant that there was not a one-to-one correspondence between bill notional amounts and their credit risk. The more signatories there were, the more the potential risk multiplied; and the more bills were used as a surrogate currency, the more these signatories proliferated. It is therefore bills of exchange *chains*, rather than swivelling, that are the most plausible cause for the destabilization of the financial system presented so far.

It should be stressed, however, that not all these bills of exchange were fictitious, or of poor credit. The rapidity with which the BOE expanded discounts every time there was a crisis, and the relative lack of evidence for heavy losses incurred by this activity,[148] not only shows its readiness to assume a de facto LOLR role, but also that it considered these bills to be fundamentally of sound credit. The issue of the asset quality is however part of a different discussion that concerns asset

[146] The earliest instance of this oft-repeated, but entirely unsupported, rumour can be found in *General Evening* Post, 20-23 June, 1772. Middlesex *Journal*, 3-5 September 1772, has a more elaborate version, though equally unsubstantiated.
[147] As will be discussed in Chapter 4, the first policy change only took place a year *after* the crisis.
[148] Clapham, *Bank of England*, I, pp. 301-2. See Chapter 4 for a longer discussion on this

speculation, speculative projects, and the corruption of insiders, and will be the subject of the following chapter.

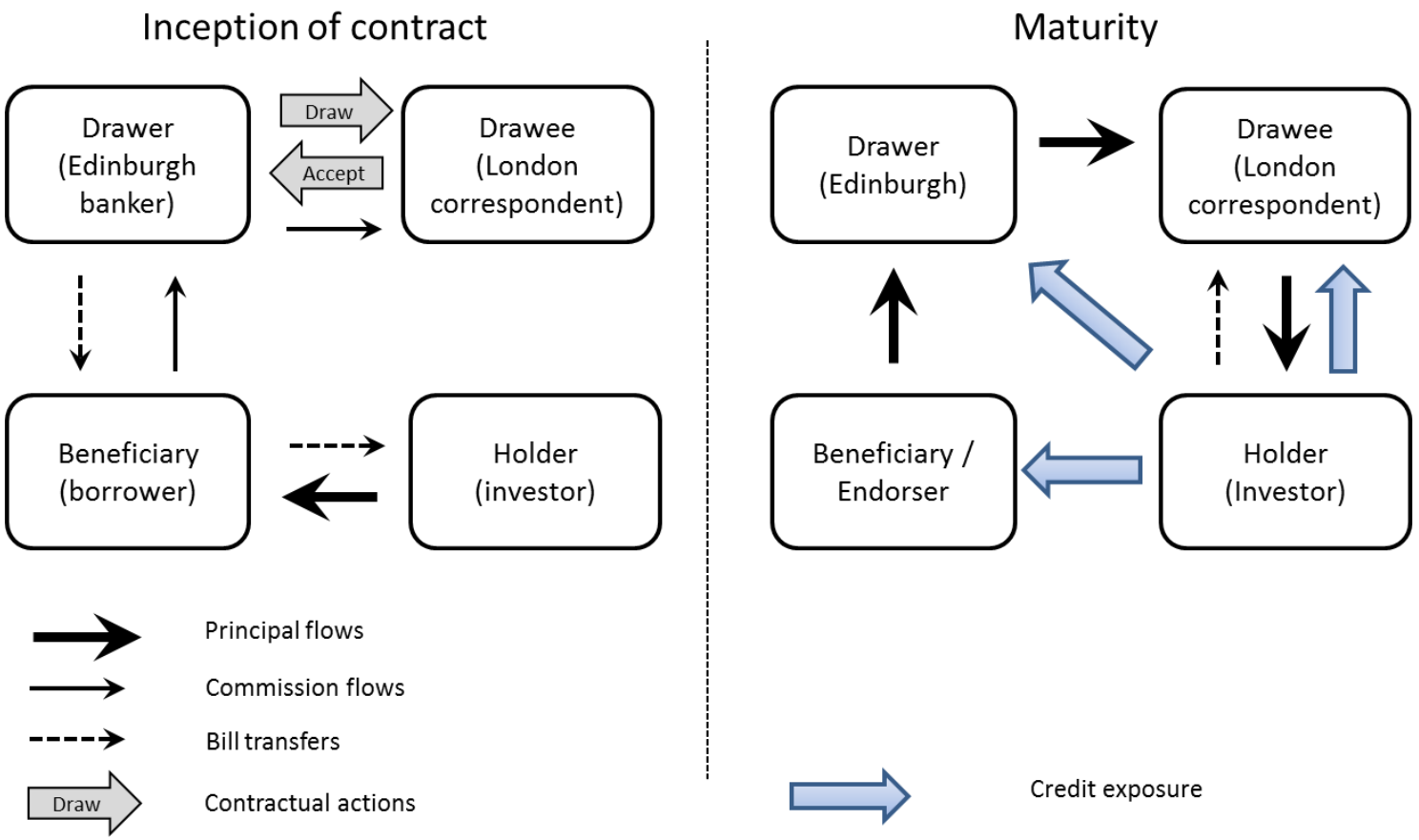

Figure 17. Outline of an international acceptance loan at inception and maturity. The interest payable to the investor is reflected in the discounted price paid by the bill holder at inception. Principal flows at maturity are at the bill's par value. Adapted from Schnabel & Shin (2004).

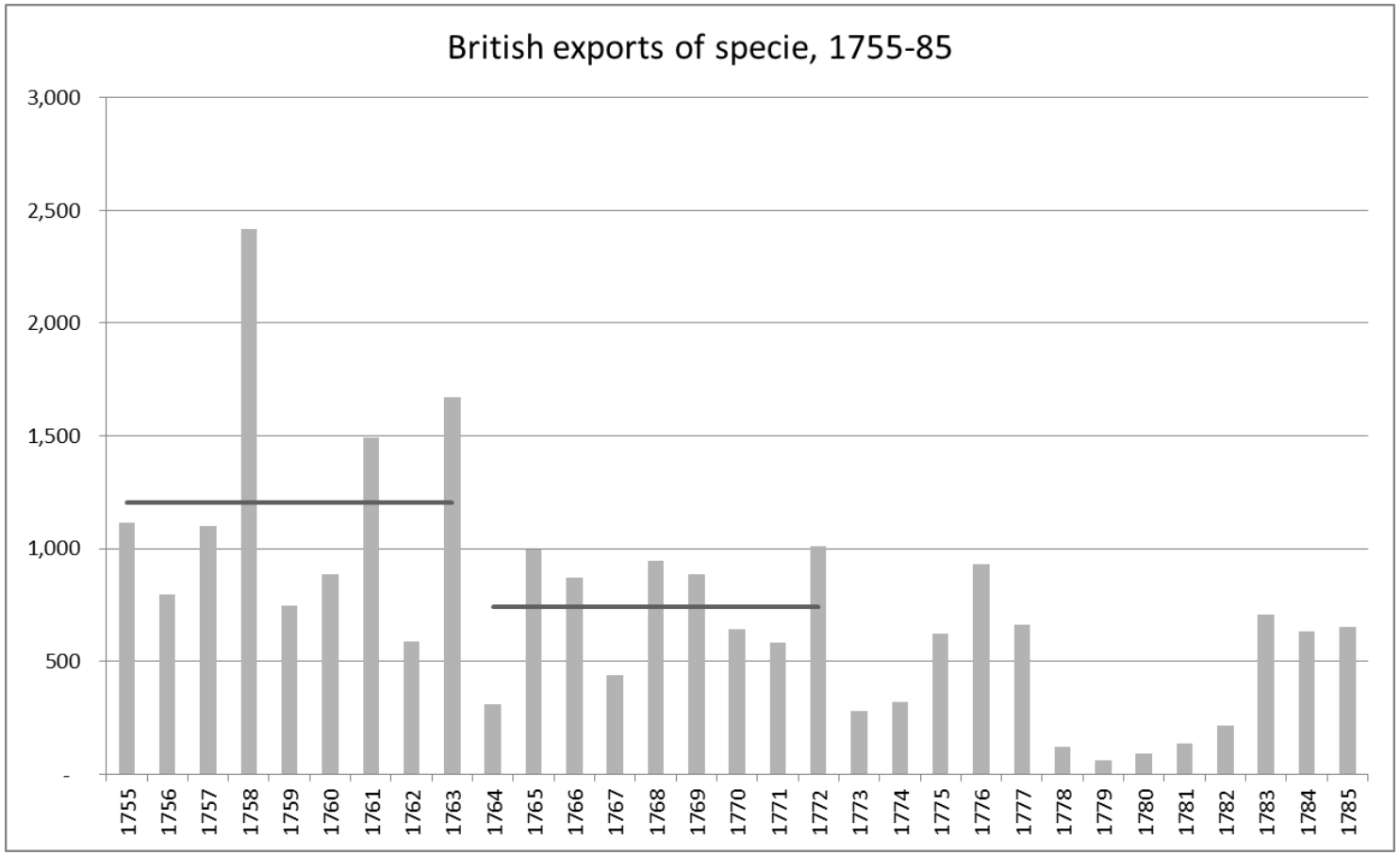

Figure 18. British official exports of specie, 1755-85. The averages for the Seven Years War and pre-1772 peacetime years are marked. Source: Boody Schumpeter, *English overseas trade* statistics, Table I.

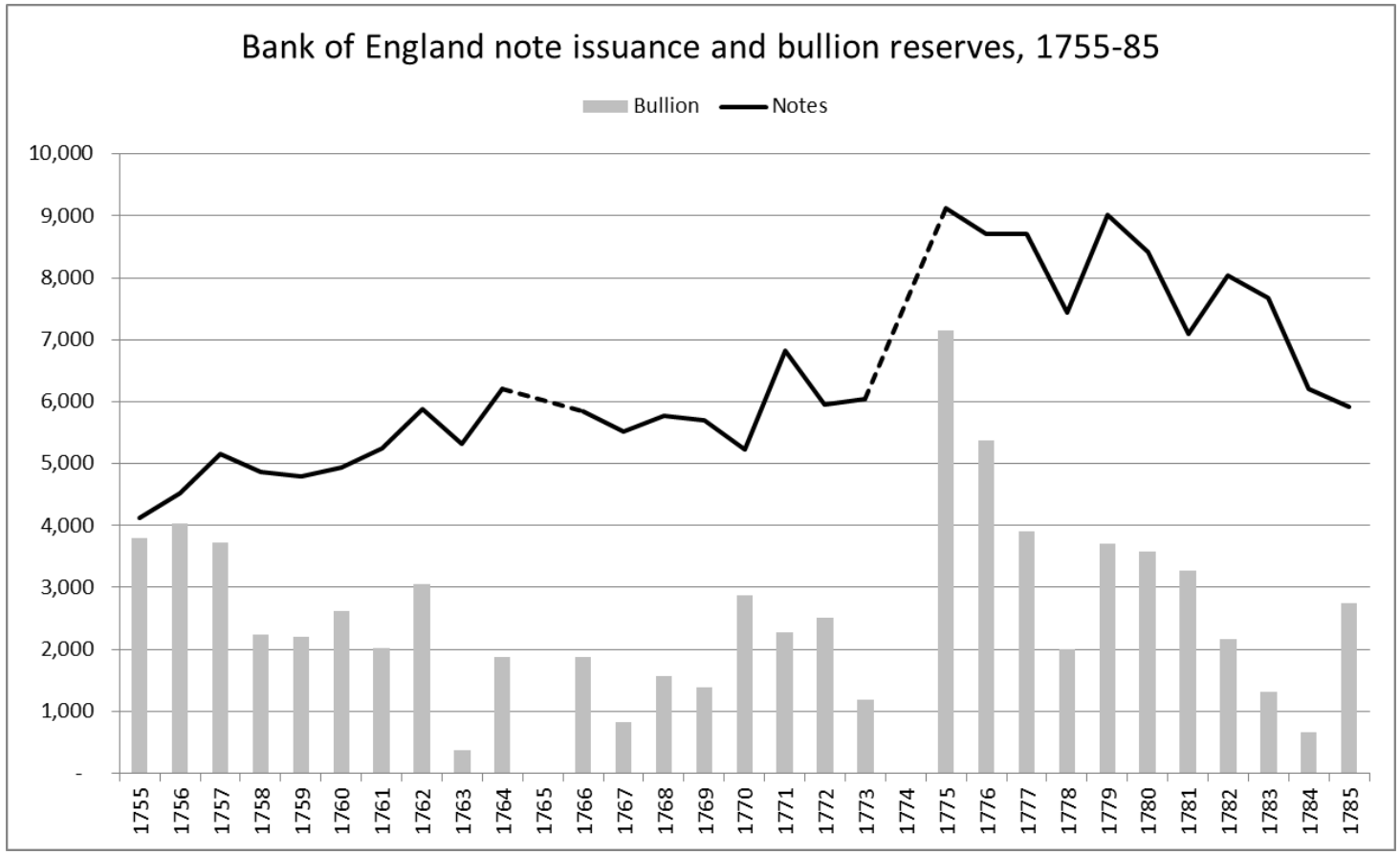

Figure 19. Bank of England end of year note issuance and bullion reserves, 1755-85. Amounts in thousands of pounds sterling. Figures up to 1764 are as of end of August, from 1766 onwards as of end of February. 1765 is therefore not represented as the accounting goes straight from August 1764 to February 1766. The figures for 1774 are entirely missing due to the gold coin recoinage of that year. Source, Clapham, *Bank Of England*, pp. 296-7.

Table 16 Example of swivelling of bills of exchange between two failed Edinburgh banks, 1772

Bill #	Amount £	Date (1772)	Maturity (days)	Drawer (Edinburgh)	Acceptor (London)	Beneficiary (Edinburgh)
1	300	13-Apr	55	Arbuthnot & Guthrie	Fordyce & Grant	Fordyce & Malcolm
2	750	13-Apr	60	Arbuthnot & Guthrie	Fordyce & Grant	Fordyce & Malcolm
3	500	13-Apr	65	Arbuthnot & Guthrie	Fordyce & Grant	Fordyce & Malcolm
19	350	18-Apr	55	Fordyce & Malcolm	Charles Ferguson & Co	Arbuthnot & Guthrie
20	300	18-Apr	60	Fordyce & Malcolm	Charles Ferguson & Co	Arbuthnot & Guthrie
21	400	18-Apr	55	Fordyce & Malcolm	Fordyce & Grant	Arbuthnot & Guthrie
22	300	18-Apr	50	Fordyce & Malcolm	Fordyce & Grant	Arbuthnot & Guthrie
23	200	18-Apr	60	Fordyce & Malcolm	Fordyce & Grant	Arbuthnot & Guthrie

Total Fordyce & Malcolm on Arbuthnot & Guthrie	£1,550
Total Arbuthnot & Guthrie on Fordyce & Malcolm	£1,550

Beneficiary: Fordyce & Malcolm		Beneficiary: Arbuthnot & Guthrie	
Maturity	£	Maturity	£
07-Jun	300	07-Jun	300
12-Jun	750	12-Jun	350
17-Jun	500	12-Jun	400
		17-Jun	300
		17-Jun	200

Source: NAS CS237/F/3/13, Court of Session, Fordyce, Malcolm & Co. vs. Arbuthnot, Guthrie, & Co., 10 June 1778.

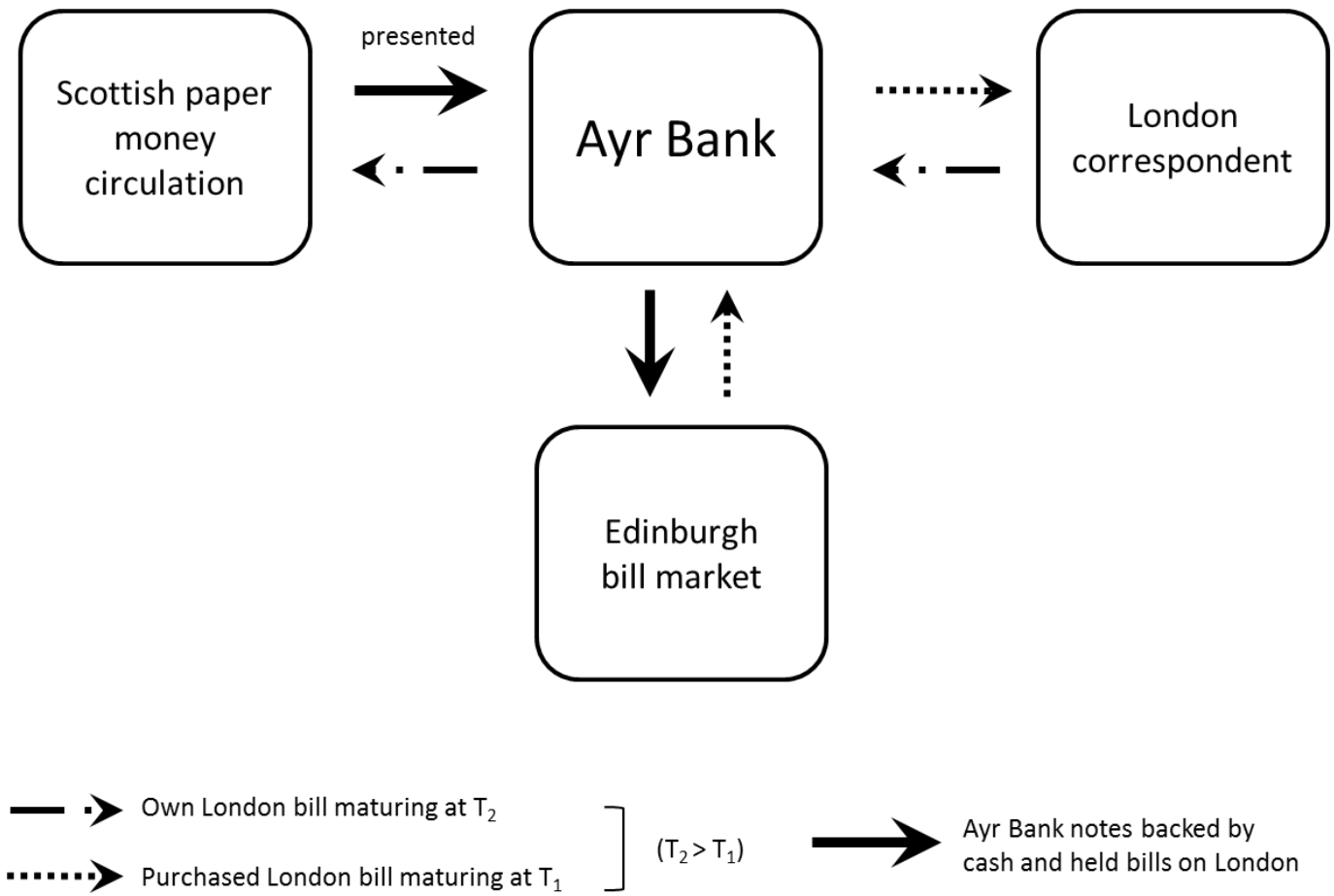

Figure 20. Diagram of the Ayr Bank's liability management. For simplicity, discount interest and commissions are omitted. Note that specie was partly used in all operations, and that the bank's own bills were used interchangeably with purchased ones to support its note circulation.

Table 17. Ayr Bank systemic position, 22 June 1772. Amounts in thousands of pounds sterling

	Ayr Bank	*Scotland*		*Great Britain*	
Country bank notes	224	868	26%	2,000	11%
Deposits	300	1,149	26%		
Private bank capital	104	500	21%	2,500	4%
Private bank long term assets	825	2,700	31%	12,000	7%
Bills on London (drawn as liabilities)	600 (50%)		most	3-7,000	9-20%
Bills on London (held as assets)	409 (33%)		most	3-7,000	6-14%

Sources: Ayr Bank: Table 11 above. Scotland: Checkland 1975, p. 235-7. Great Britain: Table 15 above, Capie, 'Money and economic development in eighteenth-century England', p. 224, Cameron, *Banking in the early stages of industrialization,* 1967, p. 32-42, Palma, 'Annual money supply over the long-run'.

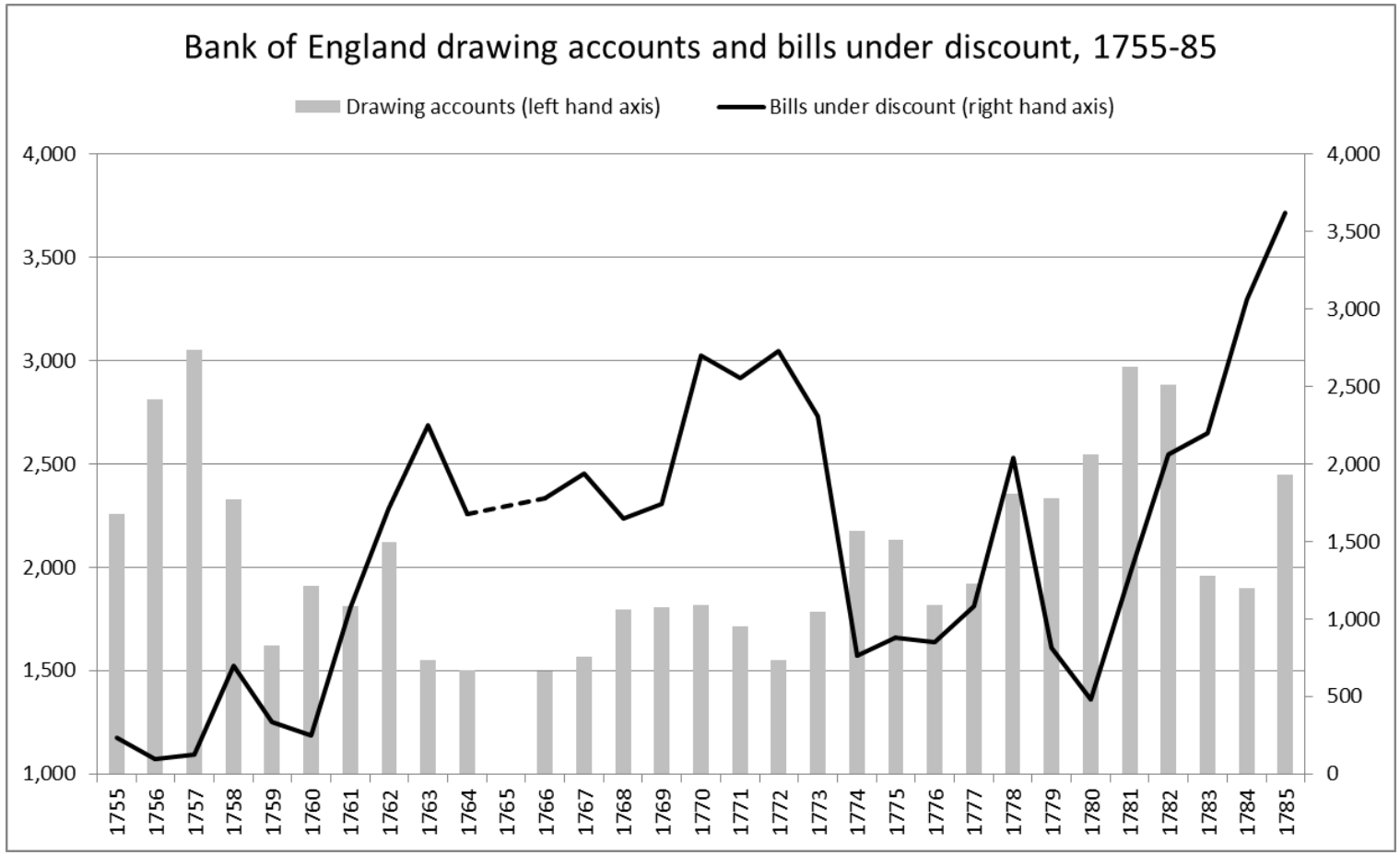

Figure 21. Bank of England end of year drawing accounts and bills under discount. Amounts in thousands of pounds sterling. Figures up to 1764 are as of end of August, from 1766 onwards as of end of February. 1765 is therefore not represented as the accounting convention goes straight from August 1764 to February 1766. Source: BOE ADM7/16-23.

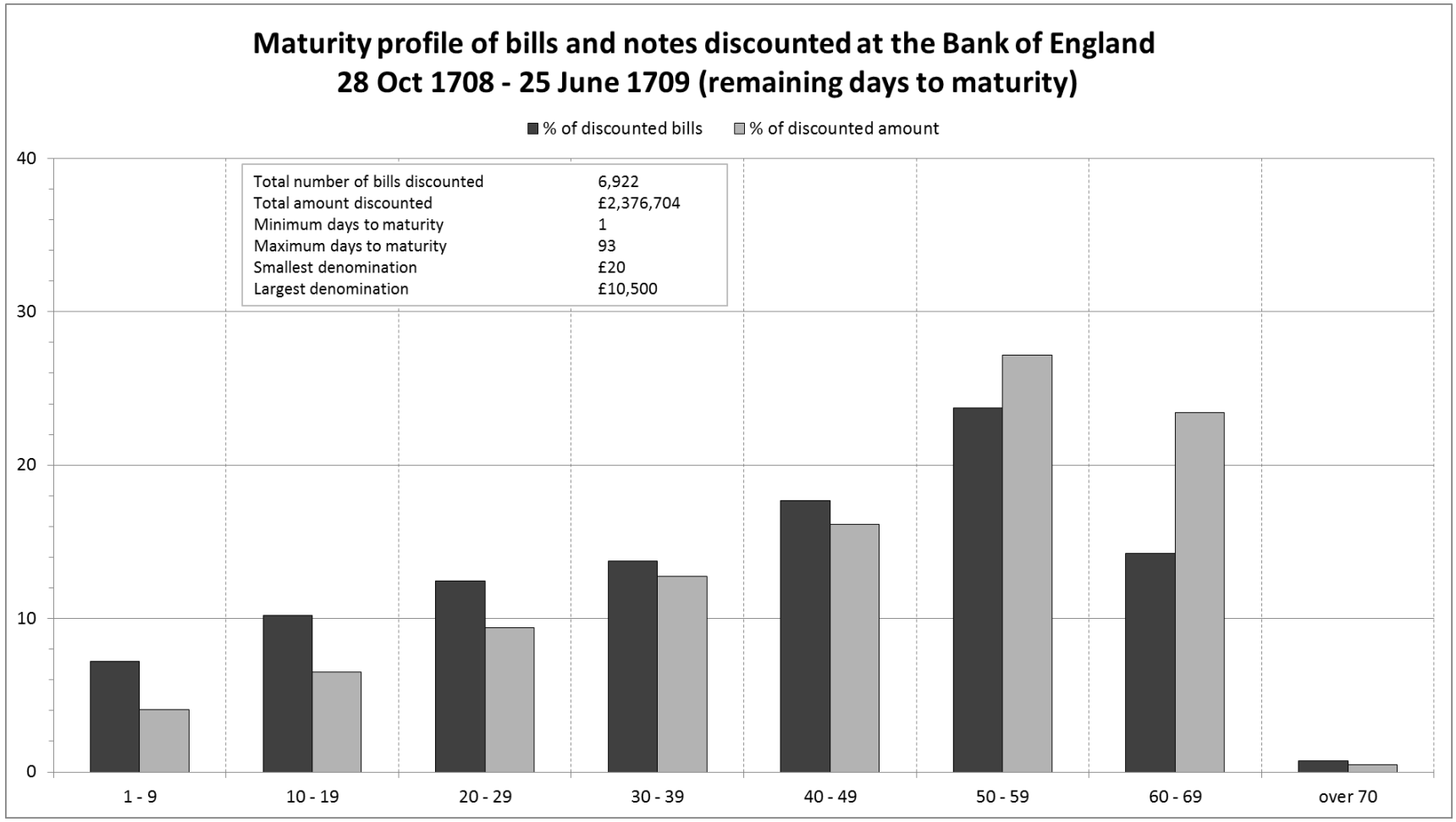

Figure 22. Maturity profile for bills and notes discounted by the Bank of England, 1708-1709. Source: BOE C28/6.